

# FUNCTIONAL AND GOVERNANCE ANALYSIS



Croatia Public Expenditure Review in Science, Technology, and Innovation

# Functional and Governance Analysis

August 2020

**Note**

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# Acronyms and Abbreviations

<b>BSO</b>	business support institution
<b>CEKOM</b>	Support to Development of Centers of Competence
<b>CoRE</b>	Centers of Research Excellence
<b>CSRP</b>	Croatian-Swiss Research Program Tenure Track Pilot Program
<b>CVCI</b>	Croatian Venture Capital Initiative
<b>ECTS</b>	European Credit Transfer and Accumulation System
<b>ERC</b>	European Research Council
<b>ERDF</b>	European Regional Development Fund
<b>ESF</b>	European Social Fund
<b>ESIF</b>	European Structural and Investment Funds
<b>GDP</b>	gross domestic product
<b>GERD</b>	gross expenditure on R&D
<b>GVA</b>	gross value added
<b>HAMAG-BICRO</b>	Croatian Agency for SMEs, Innovations, and Investments
<b>HEI</b>	higher-education institution
<b>HRZZ</b>	Croatian Science Foundation
<b>IB</b>	intermediate body
<b>IB1</b>	Intermediate Body 1
<b>IB2</b>	Intermediate Body 2
<b>IRI</b>	Increasing Development of New Products and Services from Research and Development Activities
<b>IT</b>	information technology
<b>LAC</b>	Latin America and Caribbean
<b>M&amp;E</b>	monitoring and evaluation
<b>MA</b>	managing authority

<b>MEEC</b>	Ministry of Economy, Entrepreneurship, and Crafts
<b>MFF</b>	Multiannual Financial Framework
<b>MRDEUF</b>	Ministry of Regional Development and EU Funds
<b>MSE</b>	Ministry of Science and Education
<b>NIS</b>	National Innovation System
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OP</b>	operational program
<b>OPCC</b>	Operational Programme Competitiveness and Cohesion
<b>PAR</b>	Partnership in Research
<b>PARP</b>	Polish Agency for Enterprise Development
<b>PER</b>	Public Expenditure Review
<b>PI</b>	principal investigator
<b>POC</b>	Proof of Concept
<b>PPL</b>	Public Procurement Law
<b>PRO</b>	public research organizations
<b>R&amp;D</b>	research and development
<b>RDI</b>	research, development, and innovation
<b>S3</b>	Smart Specialization Strategy
<b>SCO</b>	simplified cost option
<b>SEA</b>	South-East Asia
<b>SMEs</b>	small and medium enterprises
<b>STI</b>	science, technology, and innovation
<b>STRIP</b>	Strengthening Capacities for Research, Development, and Innovation
<b>TES</b>	technology extension services
<b>TRL</b>	technology readiness level
<b>TTO</b>	technology transfer office
<b>TTPP</b>	Tenure Track Pilot Program
<b>UKF</b>	Unity through Knowledge Fund



# Executive Summary

**The Functional and Governance Analysis is the second in a series of reports aimed at providing recommendations to improve the quality of public spending in science, technology, and innovation.** The first report, “Analysis of the Quality and Coherence of the Policy Mix,” identified the core gaps in Croatia’s National Innovation System, reviewed the policy mix in place, and provided recommendations to better match the policy response to the needs of the innovation system. Building on the findings of the first report, this second report — “Functional and Governance Analysis” — goes into the quality of each individual program, reviewing its design, implementation, and governance. The analysis is based on information collected from program managers using a semistructured interview format. The interview covers 14 categories of program design, 13 categories of implementation, and 4 categories of program governance. The responses are weighed against best practices in each category, assigning a score from 1 (lowest) to 5 (highest).

**The findings in this report can be useful in preparing for the upcoming EU financial perspective.** Development of the 2021–2027 Multiannual Financial Framework is already underway. Croatia has a window of opportunity to reflect on lessons learned from the 2014–2020 funding period and to take them forward to 2021–2027.

**The analysis detected many areas for improvement as well as some pockets of good practices that can be used for learning within the system.** For example, staff incentives, program justification, and monitoring and evaluation are weak in the majority of programs. At the same time, project closures, internal response to other policy areas, program origination processes, and identification of program outputs are strong in most programs. Only a few programs within the system have well-developed logical frameworks, appropriate objectives, and well-defined outcomes and impacts. These cases can serve as examples for learning within and across institutions.

**The quality of programs varies depending on type of beneficiary, funding source, support mechanism, budget size, target beneficiary size, and type of activity.** Programs aimed at industry-science collaboration are particularly challenging to design and implement, compared to programs aimed solely at businesses or researchers. Programs supporting businesses and researchers are also more diverse, however: some programs have many areas for improvement, others fewer. Other differences depend on funding type: ERDF-funded programs score noticeably lower than programs funded from the national budget, bilateral agreements, or World Bank loans. Programs with larger budgets and programs with narrower target populations score better than programs with smaller budgets and no size-based targeting. Non-R&D and R&D programs score roughly the same, but with greater variability within R&D programs.

**Many Croatian programs struggle with the selection process, leading to lack of predictability and irregular call publication.** The main bottleneck preventing authorities from achieving quick turnarounds from call closure to award has been the selection process. Finding reviewers in advanced fields has been challenging. This is compounded by the requirement that all reviews be conducted in Croatian, which significantly reduces the

pool of potential reviewers. Programs funded from the national budget are more flexible in that respect, but they face uncertainty in budget allocation, which is determined from one year to the next. Agile and quick project proposal processing and funding predictability are crucial for effective spending and for achieving results. Maintaining such a structure will allow Croatia to stay on track with the fast-paced research and innovation environment and allow researchers and businesses alike to plan their activities.

**Programs require better-developed justifications, more consideration of alternative instruments, and mainstreamed use of logic models.** The analysis and description of the market failure are often informal and lack sufficient detail to justify the particular program, including its design and choice of instruments. The most commonly used instruments are grants, which is not always the most effective choice; for some interventions financial instruments could more effectively address market failures. Very few programs are supported by fully developed theories of change and logic models, use of which would help inform design and resource planning and manage expectations for the program's impact.

**Engagement with applicants and beneficiaries has been challenging.** The challenges relate to rigid selection criteria, insufficient transparency, and administrative and compliance burdens. Authorities do not have sufficient flexibility in setting selection criteria, especially when the program is funded from EU structural funds. Further, the burden on applicants and beneficiaries, from application to implementation, is high, and the help of consultants is often required to navigate the process. Applicants and beneficiaries lack clarity on the process in part because not all procedural aspects are made publicly available (for example, the Common National Rules) or covered by the public consultation process (for example, selection methodology).

**Responding to the demanding institutional, regulatory, and funding framework requires more investment into human resources.** Capacity in innovation policy developed prior to 2014 has to a large extent been lost due to staff turnover. Staff has limited performance incentives and few prospects for career development.

**Programs do not have built-in impact evaluation mechanisms.** Without the evaluation function, it is difficult to obtain evidence of program effectiveness and impact. This, in turn, impedes program learning and adjustments. While monitoring and tracking outputs is more widespread, it is not efficiently implemented, with parallel online and offline tracking that doubles the work for the program officers maintaining the data.

**The fragmented governance and insufficient coordination of STI policy reflects on program functionality.** Fragmentation is apparent both from a horizontal and a vertical perspective. From a horizontal perspective, the split of the innovation agenda between private and public creates gaps in areas that fall between, such as industry-science collaboration and research commercialization, which have no clear ownership. Issues with the vertical perspective relate to managing EU structural funding, which involves many institutions with different roles. For this complex institutional setup to work well requires a high degree of coordination and clear communication between institutions that have not always been forthcoming.

**Priority areas for improvement differ for each institution involved in research and innovation policy.** For example, areas for improvement in the Ministry of Science and Education

relate to the predictability of calls and to ensuring a smooth and fast selection process; the ministry's programs have relatively better scores on resource management, program origination, and justification. The Ministry of Economy, Entrepreneurship, and Crafts does well at stakeholder engagement, but it would benefit from better resource management, particularly staffing, training, and staff incentives. The Croatian Science Foundation excels at reliably publishing calls and having a consistent timeframe for project selection. Its main area for improvement relates to the endogeneity of selection panels as well as maintaining adequate and predictable budget resources. HAMAG-BICRO, as the institution charged with facilitating several pan-European programs, performs well in areas related to activities, identification of beneficiaries, and outputs, but it struggles with adapting programs to local contexts and achieving a good fit with the rest of the policy mix.

**The experience of the 2014–2020 programming period should be taken into account in efforts to improve the national rules related to management and control of EU funding for the next EU funding cycle.** The Common National Rules developed for the delivery of the Operational Programme Competitiveness and Cohesion 2014–2020 have been ambitiously defined and are overly prescriptive in some areas. The rules should be upgraded in the new funding cycle to allow for more flexibility in management and faster deployment of funds.

**Recommendations are organized into the following six priority areas:**

1. *Policy governance and coordination.* Coordination of innovation policies should be upgraded by strengthening the role of the National Innovation Council. A long-term commitment for consistent STI policy is needed, which will provide a framework for business planning for all actors in the NIS. Project funding from the national budget should be an important feature of the system, embedding STI policy instruments into medium-term budget planning. In addition, the role of institutions involved in EU structural funding should be reexamined with a view toward streamlining the institutional setup. Institutions in the ESIF management and control system should upgrade their coordination and information sharing practices. In the short term, the coordination between the Ministry of Science and Education and the Ministry of Economy, Entrepreneurship and Crafts should be strengthened to mitigate the fragmentation of the STI policy agenda. Over the medium term, establishing an innovation agency would lead to a focused approach and greater streamlining in the national innovation system. At the program level, empowering program managers to take charge of the full program cycle would facilitate coordination of program activities, from design to results.
2. *Program design.* Correctly identifying market and system failures and finding the optimal solution to address them should be the first step in designing a program. Each design should be supported by a sufficiently detailed diagnostic. More funding should be provided for early-stage R&D in firms. The program design process should also entail an analysis of alternative options to address the identified market failures. Options to use ESIF financial instruments in the area of RDI should be explored. Logic models should be mainstreamed, not as a bureaucratic requirement, but as a dynamic tool used to document changes to the program and as a basis for program learning. As part of the logic model, a full catalogue of inputs, activities, and administrative costs should be developed to help with resource planning. Program objectives should be revised where necessary to properly reflect the contributions and added value of the program.

3. *Interactions with beneficiaries.* To facilitate planning of research institutions and businesses, calls need to be published at regular and predictable intervals. Decreasing burdens on beneficiaries should be a priority, including by reducing procurement burdens, fully digitalizing the application process, and simplifying the payment request procedure in order to minimize liquidity pressures on beneficiaries. It would also be helpful for beneficiaries and potential beneficiaries to increase transparency in the process by publishing the Common National Rules and expanding the scope of public consultations.
4. *Selection process.* Research and innovation programs require more flexibility in setting selection criteria, which would allow better targeting of market failures. To make the selection process more agile, it is necessary to streamline it, as well as reduce documentary requirements for applicants. Appeals procedures should also be streamlined and appeal filings should not block further assessment of other projects. Delays in the process should be reduced, and to ensure accountability, data on the duration of application assessment for each program should be collected and published. To reduce delays in project selection, pools of experts should be established to quickly fill positions on a review panel. Submission of project proposals in English should be allowed to enable the hiring of international reviewers. Further, reviewers should be adequately compensated for their work. The project proposal review process should be reconsidered, facilitating the procurement of expert reviewers, including from abroad, and testing new approaches in project selection such as using in-person pitches of project ideas. A quicker, more agile selection process would allow authorities to commit to publishing more calls at regular intervals.
5. *Monitoring and evaluation design, implementation, and learning.* Monitoring and evaluation require developing technical capacities to design and interpret results, particularly when it comes to rigorous quantitative evaluations. Training should be provided to permanent staff in M&E units, while technical experts for impact evaluation could be hired on an as-needed basis. Indicators used in the M&E system should be revised and rationalized to include standardized output, outcome, and impact indicators and disaggregations as well as process indicators. Manual data compilation should be minimized. M&E systems should be used to inform decision making, learning, and evidence-based adjustments, and evaluation plans should be created for the most important programs.
6. *Human resources.* Hiring, retaining, and training professionals specialized in innovation policy and management should be priorities over the next several years. This requires providing competitive working conditions and opportunities for career and professional development. Long-term, tailor-made training plans should be developed, both for staff and external experts. An employment plan should be used to manage internal staff relocations and promotions, which could broaden and strengthen staff skills and competencies, and create new opportunities for professional development. Systems for human resource analysis should be expanded to cover an assessment of task division among the Managing Authority and Intermediate Bodies, as well as strategies for staff attraction and retention. Career incentives, pay raises, and bonuses should be linked to staff performance in light of remuneration rules in the public sector.

# Introduction

**The Functional and Governance Analysis is part of the Croatia Public Expenditure Review (PER) in Science, Technology, and Innovation (STI).** The PER in STI is a methodological approach developed by the World Bank that aims to examine public spending for STI and provide actionable recommendations to increase its effectiveness. This work is conducted by the World Bank at the request of the Ministry of Science and Education (MSE), in close cooperation with the Ministry of Economy, Entrepreneurship, and Crafts (MEEC) and other stakeholders.

**This report builds on the previous work done under the PER in STI in Croatia.** Figure A presents a summary of these activities.<sup>1</sup> The first component of the project — a look at the quality and coherence of the policy mix — provided a bird’s-eye view of the flow of funds in the STI system, budget, and policy mix and showed how that flow matches up to the needs of the National Innovation System (NIS) and the broader economy. The report, *Analysis of the Quality and Coherence of the Policy Mix* (2019), detected, among others, the following issues:

- Croatian firms, especially smaller and younger ones, exhibit a positive relationship between innovation based on research and development (R&D) and productivity growth; however, the bulk of public support has been directed toward older firms and existing ventures.
- Public research sector reform is incomplete, with legacy issues hampering interinstitutional collaboration and competitive financing, ultimately stifling research excellence.
- Despite a significant increase in availability of STI funding after accession to the European Union (EU), Croatia has not caught up to its EU peers in scientific and innovation performance.
- Support programs often aim to cover a very broad set of objectives, which usually results in complex program design.
- Many programs, including some of the largest ones, encountered extended implementation delays. Some application assessments have taken a few years to complete.

**The Functional and Governance Analysis expands on the work done so far by conducting in-depth assessments of each program's functionality in the policy mix.** The analysis focuses on reviewing the design, implementation, and governance of public STI support programs. While the analysis under the first component was based on a desk review, the

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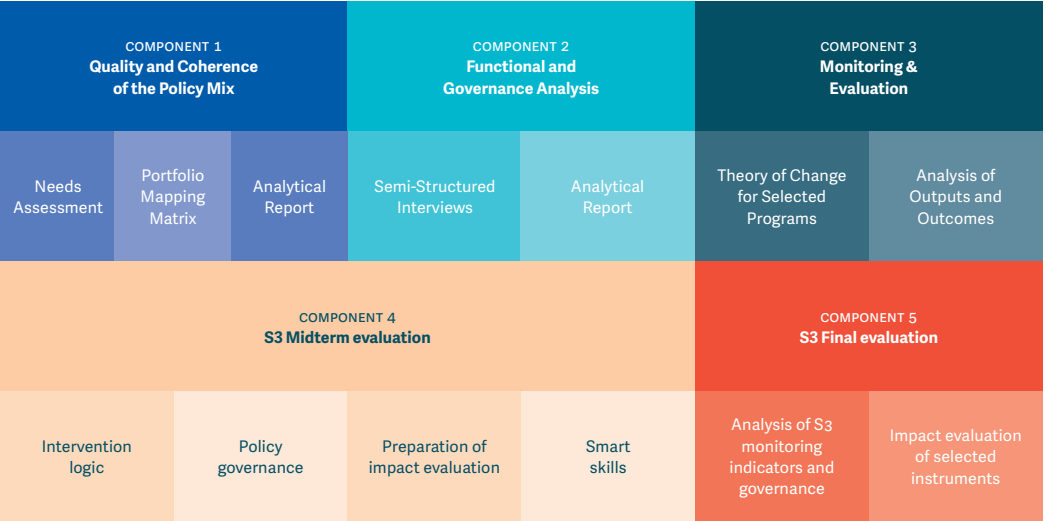
<sup>1</sup> The scope of the project was expanded in early 2020 to include a review of the Smart Specialization Strategy 2016–2020 (S3). The S3 is often considered as anchor for Croatia’s innovation policy, defining its governance, interventions, and administration.

Functional and Governance Analysis relies on first-hand accounts from the field collected through semi-structured interviews. This approach allows thorough understanding of each individual program and provides the opportunity to collect qualitative information unavailable outside an interview setting.

**Where available, information collected through interviews with program managers was complemented with accounts from individual beneficiaries.** While not sufficient to make a definitive judgment on the functionality of programs, these anecdotal accounts can provide an insight into the experiences of individual beneficiaries. The accounts are presented in separate boxes titled “Stories from beneficiaries.” A more comprehensive and representative analysis of beneficiaries’ perceptions is currently underway under Component 3 of the project (Monitoring and Evaluation).

**This report is organized into five sections.** The first section details the methodology behind the semi-structured interviews constituting the report’s main source of information. Section 2 presents the primary findings, first by reviewing overall results and then by diving deep into each of the 31 areas of review.<sup>2</sup> Section 3 highlights crosscutting issues that affect support programs in Croatia and provides further context and best practices. Section 4 reviews the framework of the management and control system for European Structural and Investment Funds (ESIF), Croatia’s largest STI funding source. Specifically, Section 4 examines the Common National Rules defining the rules of engagement, policies, and procedures for deploying EU funds. The report concludes in Section 5 with a set of policy recommendations.

**Figure A.** Activities within Croatia PER in STI



Source: Staff elaboration.

<sup>2</sup> In addition to the data presented in this section, the authorities will be provided with a set of additional charts in electronic form to ensure granularity and understanding of the findings.

“All truths are easy to understand once they are discovered; the point is to discover them.”

— Galileo Galilei

# 1

# Methodology





# Methodology

**The Functional and Governance Analysis aims to provide evidence-based recommendations for improving the design, implementation, and governance of STI support programs.**

Designing and implementing innovation support programs is challenging, particularly considering the need to properly identify market or system failures, select the proper intervention instrument, and respond to highly interacting drivers of change. The analysis assesses the quality of processes, starting with design and implementation and covering monitoring and evaluation systems, complementarities within and across institutions, and integration with institutions and regulations outside the STI system. The results of the analysis are then used to formulate recommendations to bridge the observed gaps in the functionality of STI programs and align with best practices.

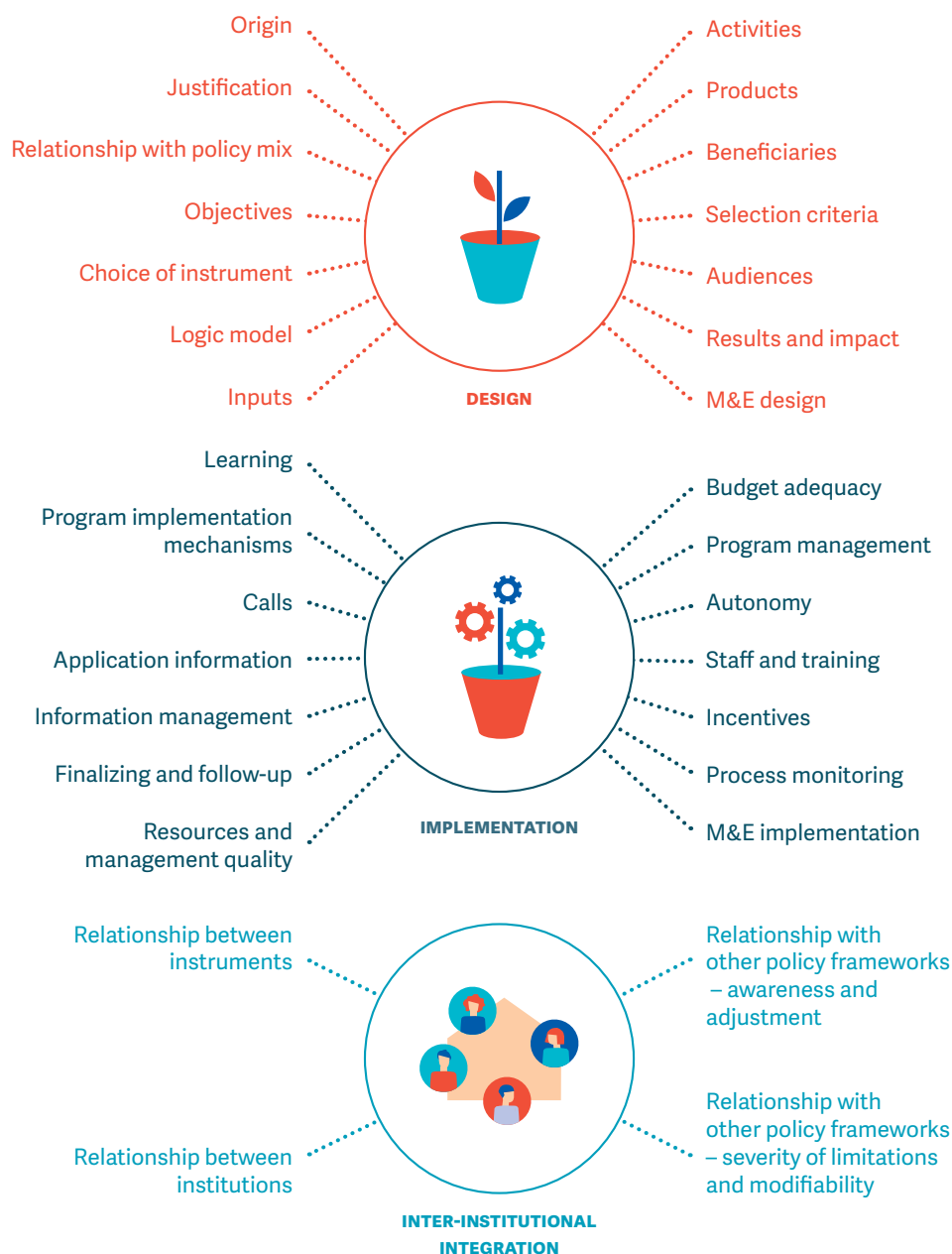
**The methodology for the analysis is based on a comprehensive analytical framework benchmarked to international best practices.**

The analytical framework, developed by the World Bank, covers 14 areas of program design, 13 areas of implementation, and 4 areas of program governance (Figure 1.1). A short description of each area is presented in Appendix II. The functionality of individual STI programs is scored on a scale of 1 to 5 in each area, where 5 denotes international best practice and 1 denotes the absence of best practices. Appendix III provides some practical examples of best practices. The assessment is based on a scoring guideline that provides the criteria for assessment in each area and assigns a description to each score. The information used to make the assessment is collected through semi-structured interviews with program managers and from official documents describing program objectives and implementation antecedents. Each interview is conducted by two interviewers/specialists using a specially designed protocol that allows collection of detailed and unbiased information about each program. After completing the interview, each interviewer assigns a score to the program independently, based on the scoring matrix and a review of pertinent documentation. The interviewers then discuss and assign a final consolidated score, which is reviewed by the entire PER team.

**The analysis reveals whether these key elements of effective innovation policies have been met:**

1. *Rationale and design of each policy instrument.* Policy practitioners must ensure they are solving a real problem and avoid the trap of addressing false failures. Interventions should follow a logic model with a clear, well-thought-out theory of change. Moreover, policy makers must be careful not to copy external forms without proper functions (Pritchett, Woolcock, and Andrews 2010) and avoid potential capture by certain beneficiaries.
2. *Efficacy of implementation.* Policy practitioners must measure, learn, and adapt to improve process implementation, particularly in the context of pilot interventions. As has been well documented, managerial practices in public service matter (Rasul and Rogger 2016), with better managed projects usually leading to better outcomes. Appropriate staff incentives can improve innovation program management.

**Figure 1.1** Analytical framework for functional and governance analysis



Source: Staff elaboration.

- 3. Policy coherence across the NIS.** Stated priorities and expenditure commitments must be coherent. In addition, practitioners should avoid disparity in budget sizes across programs and overlap of instruments or inertia despite instrument change.
- 4. Policy consistency and predictability over time.** Developing a dynamic innovation system can take decades of deliberate and consistent policy follow-through. Long-term predictable financial and institutional commitment is often necessary. In many countries, institutions experience constant leadership changes and politically driven disruptions that undermine the foundations of previous achievements.

**The Functional and Governance Analysis is not an evaluation of program manager performance and institutional competence, nor is it an impact evaluation.** The method does not attribute responsibility to any one individual. In most cases, managers do not have control over all functional dimensions of a program. Rather, most issues are structural and point to higher-level processes and regulations. The Functional and Governance Analysis connects the program mechanism with outcomes, highlighting the role of a program's ex ante processes and intangible elements.

**In addition, any interpretation of scores should consider the context of each individual program.** For example, programs that have been running for a long time will benefit from a learning and adjustment process over the years. Conversely, complex, newly introduced programs (especially those funded from EU funds, which have a notoriously steep learning curve for implementation) are likely to suffer from "growing pains." The scores are not meant to serve as indictments of a program or the institutions that run it, but to provide guidance for bringing the program's design, implementation, and governance closer to international best practices.

**The scores are analyzed from multiple complementary perspectives.** For simplicity, the scores are summarized using the mean (simple average) of individual scores. To enrich the analysis, the mean is complemented by additional statistical measures such as the median, standard deviation, and range. The median provides information on the middle value and is useful to control for effects of extreme values on the mean, which may not be representative of the population of scores. For example, if the median score is above the mean, it indicates that a few programs are bringing down the average score. The standard deviation and range are used to measure the variation of scores. The standard deviation is a measure of difference of individual scores from the average – the lower the standard deviation, the closer individual scores are to the average. Range is a simpler measure of variation, representing the difference between the maximum and minimum score. Where possible, histograms are used to illustrate the distribution of individual scores. In addition, a cluster analysis was conducted and the results are presented in Appendix IV.

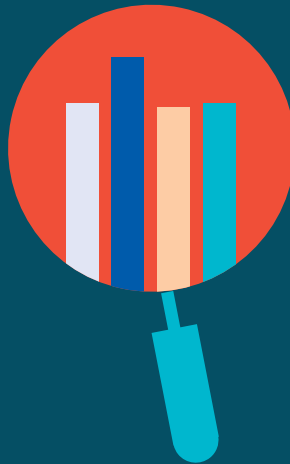
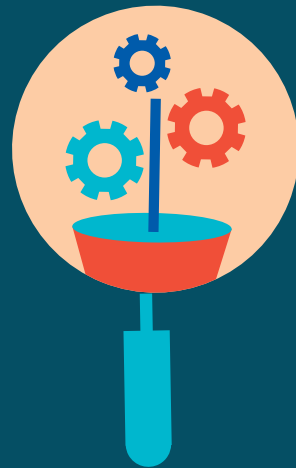
**Interviewer bias and scoring fatigue were mitigated through quality assurance mechanisms and workload planning.** In Croatia, interviews were conducted by a few teams of interviewers undertaking no more than two interview sessions each per day. Interviewers rotated between teams throughout the data collection process to eliminate bias in interpretation of scoring criteria. The teams always consisted of one international and one local expert who complemented each other's knowledge of the methodology and the country context. Interviewer teams were supported by at least one note taker who took verbatim contemporaneous notes of the responses. In addition, the teams reviewed the scoring of a program after it was completed. The full set of scores was reviewed again by the entire team to ensure that all scores were consistently assigned.

**While the analysis relies on interviewees' accounts, supporting program documentation was reviewed to ensure a comprehensive view.** Prior to the interviews, the team reviewed available documentation on each instrument. One limitation the team faced was that the accuracy of the information received was not always verifiable. Due to staff turnover in some cases, especially for older programs, the team was unable to reach the program managers who had originally participated in program design. Where possible and available, however, the team obtained documentary evidence to support interviewees' testimony.

**The sample of programs covered in the analysis represents 77 percent of the STI project financing from 2014 until 2020.** The portfolio mapping exercise done under the first component of the project provided the basis for a two-step sample selection. The mapping identified 68 STI programs with a total allocation of EUR 1.2 billion. For the functional analysis, the first step excluded direct awards; programs that financed innovation policy activities; documentation for research infrastructure; laws; and programs that will not be implemented again in the future. The second step combined some programs into one (for example, SIIF I, SIIF II, and SIIF III). The resulting sample consisted of 36 programs, of which 8 were led by MSE, 15 by MEEC, 2 by the Ministry of Regional Development and EU Funds (MRDEUF), and 8 by the Croatian Science Foundation (HRZZ); also covered were 3 transnational EU programs implemented through the Croatian Agency for SMEs, Innovations, and Investments (HAMAG-BICRO).

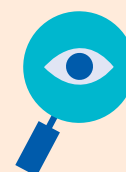
# 2

# Findings



# Findings

- Programs overall have ample room for improvement in all aspects of program design, implementation, and governance.
- Support for industry-science collaboration appears more challenging to design and implement than programs dedicated to the research and business sector. Those programs, on average, score better than collaboration programs and have a higher degree of variability, with some programs in these categories doing much better than others.
- The functionality of programs varies depending on the source of funding: programs funded under the European Regional Development Fund (ERDF) score lower in all dimensions than programs financed from national budget funds, bilateral agreements, and the World Bank.
- Programs that target small and medium enterprises (SMEs) and micro firms are associated with better scores than are programs with no size-based targeting, particularly in terms of design and governance.
- Grant schemes on average have better design, implementation, and governance than voucher schemes. The policy mix contained only two voucher schemes, but their common issues appear to be insufficient targeting of the beneficiary population and a limited pool of service providers. Only one equity instrument for innovation is currently in use.
- Both R&D and non-R&D programs perform moderately well on average. R&D programs show significant disparities in functionality, however, from well-justified interventions, formal, clear, and transparent processes, articulated theories of change, and established implementation procedures to unclear justifications, overly broad objectives, and selection criteria incongruous with the intended effects of the program.



## Design

- Several areas in program design, namely output identification, audience engagement, and program origination process are close to best practices, with only minor shortcomings.
- Most areas of program design display moderate results. For example, most programs operate with an implicit logical framework and with an incomplete catalogue of inputs, activities, and outputs. In most cases, target beneficiaries are broadly defined, and selection criteria do not always align with the program's stated policy goals.
- Objectives, results, and impact stand out as the areas in which most programs are farthest from best practices. Objectives are often too broadly formulated and are sometimes set at the level of outputs. Little consideration is given to possible impact evaluations and result measurement at the design stage.



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## Implementation



- Most programs have excellent procedures for project and program closure, in line with international best practices. Areas with minor shortcomings include transparency of application information and application and selection processes.
- A number of areas have good foundations but could be improved. For example, many programs do not have a transparent and reliable calendar of calls, making it difficult for applicants to plan their projects and resources. Learning from one call to the next usually occurs,<sup>3</sup> leading to program adaptations, but the process is not fully documented. In most cases, only one call occurs over a longer time and opportunities to improve from one call to another are limited. Program management, especially in the ESIF funding framework, is sometimes difficult, since it involves at least three institutions: a managing authority (MA) and two intermediate bodies (IB1 and IB2). Coordination between them can be challenging.<sup>4</sup> A basic monitoring system works on a continuous basis, but it is often complemented by a parallel “offline” system that tracks more granular data and different disaggregations. While useful, this puts a burden on institutional resources and introduces more possibilities for human error. Usually there are no evaluation systems in place, or they are set ad hoc, if at all.
- Process monitoring and staff incentives should be significantly improved. In most cases, process monitoring is very limited, does not occur regularly, and does not inform management decisions. Staff incentives do not exist in most institutions beyond a basic performance review framework that does not reward excellent performance or penalize underperformers.

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## Governance



- Most programs explicitly acknowledge the link with other complementary programs and maintain communication and coordination among themselves. Overlaps are typically avoided. Programs have a high level of awareness of legislative and regulatory constraints and adapt to accommodate them.
- Interinstitutional coordination is often challenging. Practices in Croatia range from informal, sparse, and sporadic efforts at communication across institutional boundaries to partial coordination to formal coordination at the tactical level.
- When programs face limitations related to other policies or regulations, the difficulty of removing the constraint tends to be quite high. In the research sector, this relates to the high fragmentation in the research sector and incentive framework for researchers. In the private sector, difficulties relate to complex state aid rules. Both sectors face challenges with respect to burdensome procurement rules.

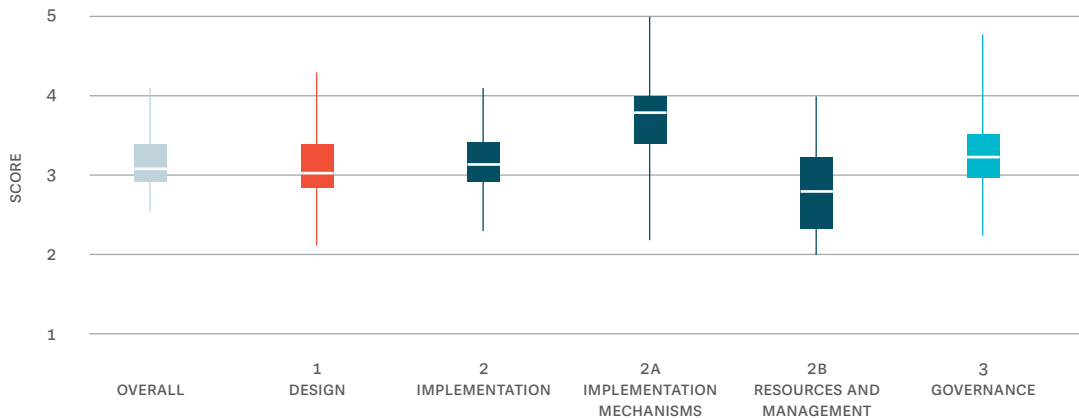
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<sup>3</sup> It occurs in cases with more than one call.

<sup>4</sup> See section 3.11 for more details.

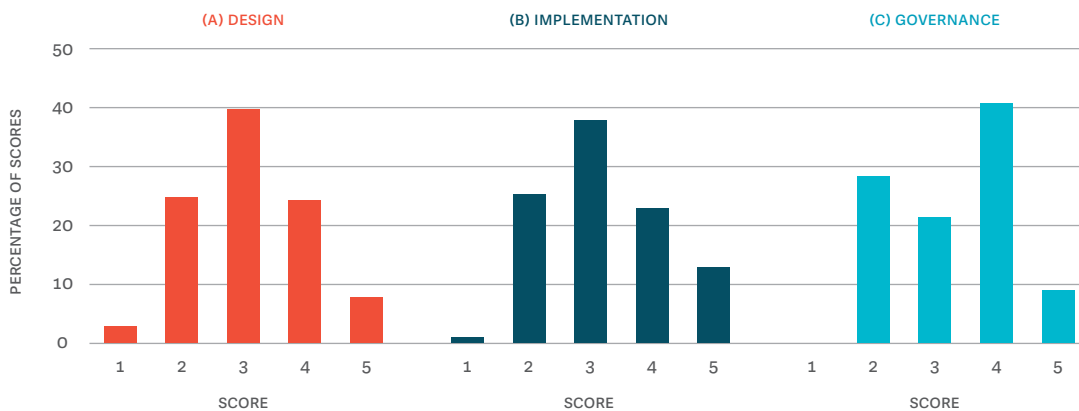
**The functional analysis reveals room to improve all aspects of program design, implementation, and governance: in each dimension the mean score is slightly above the middle score.** Figure 2.1 presents the distribution of average scores for each category through box plots. The top 25 percent of scores are placed in the range represented by the line above the box, and the bottom 25 percent of scores are placed in the range represented by the line under the box. The boxes represent the middle 50 percent of the score distribution, and the horizontal line within the box is the median. Half of the overall average scores fall between 2.9 and 3.4. Design, implementation, and governance scores are concentrated in a similar range. Median scores for program design are slightly lower (3.1) compared to median scores for implementation (3.2) and governance (3.3). Within the implementation dimension, however, we find that implementation mechanisms (such as calls for proposals, transparency of criteria, project database, and closures) score systematically higher (half of the programs are in the range of 3.4 to 4). The real implementation weaknesses are resources and management quality, where half of the programs score in the range of 2.3 to 3.2.

**Figure 2.1** Scores in program design, implementation, and governance are roughly at a similar level



Source: Staff elaboration.

**Figure 2.2** Distribution of scores

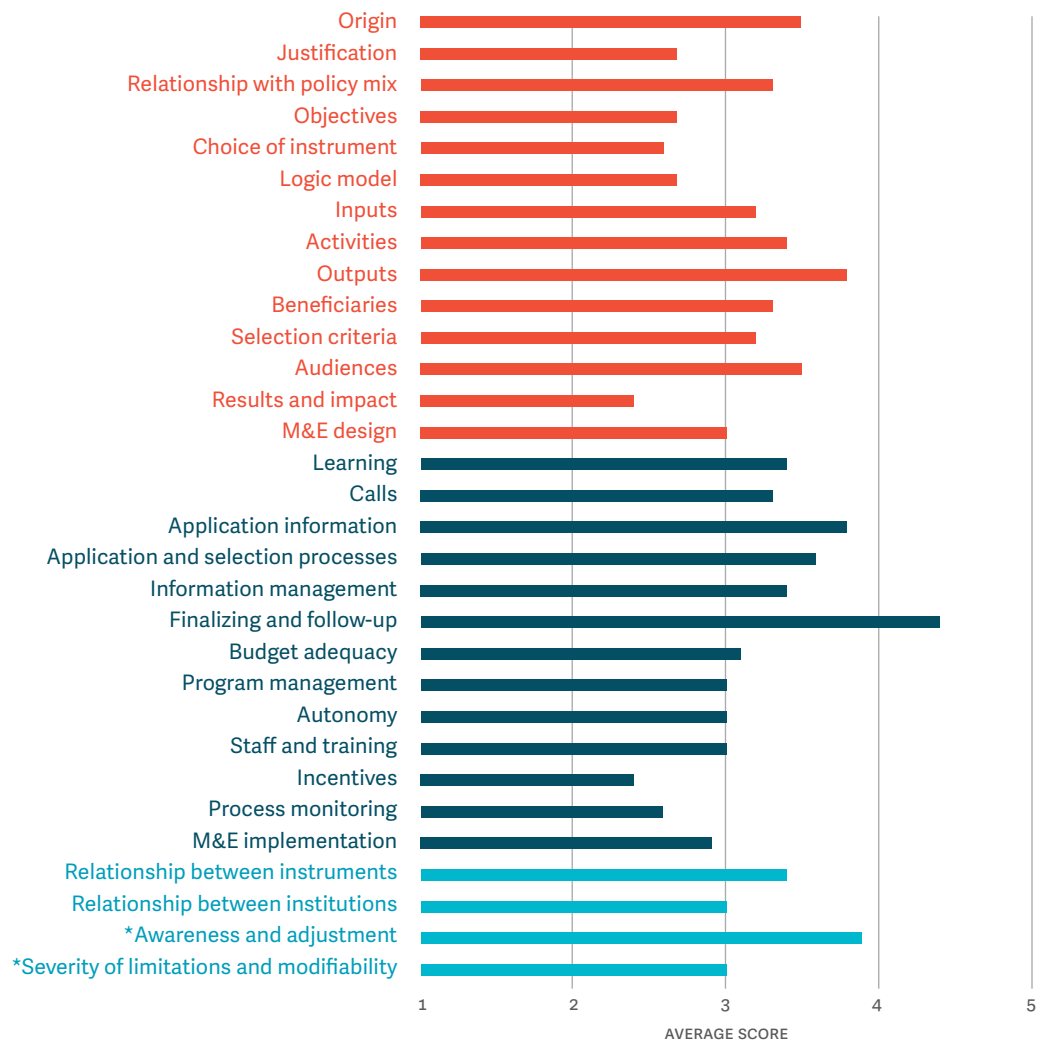


Source: Staff elaboration.



**Some areas lag behind international best practices by a sizable margin.** Figure 2.3 presents the average scores for all STI programs in 31 areas of analysis. On the design side, main areas for improvement are justification of the program, formulation of instrument objectives, and consideration of alternative instruments. Further, most programs do not have a well-developed, explicit logic model. While programs do a fair job of identifying outputs, measuring expected outcomes and impacts appears to be more challenging. At the implementation stage, programs fall short, particularly in areas of resources and management. Programs are often constrained by staffing issues, lack of incentives related to program performance, and insufficient process monitoring. The implementation of calls, application, and selection processes have been difficult, with delays affecting the largest and most important STI support programs. Scores for governance are, on average, slightly better, but some aspects of institutional relationships can obstruct effective program design and implementation, particularly in the context of the complex institutional framework for ESIF funding.

**Figure 2.3** Most areas of program design, implementation and governance fall behind best practices



Source: Staff elaboration.

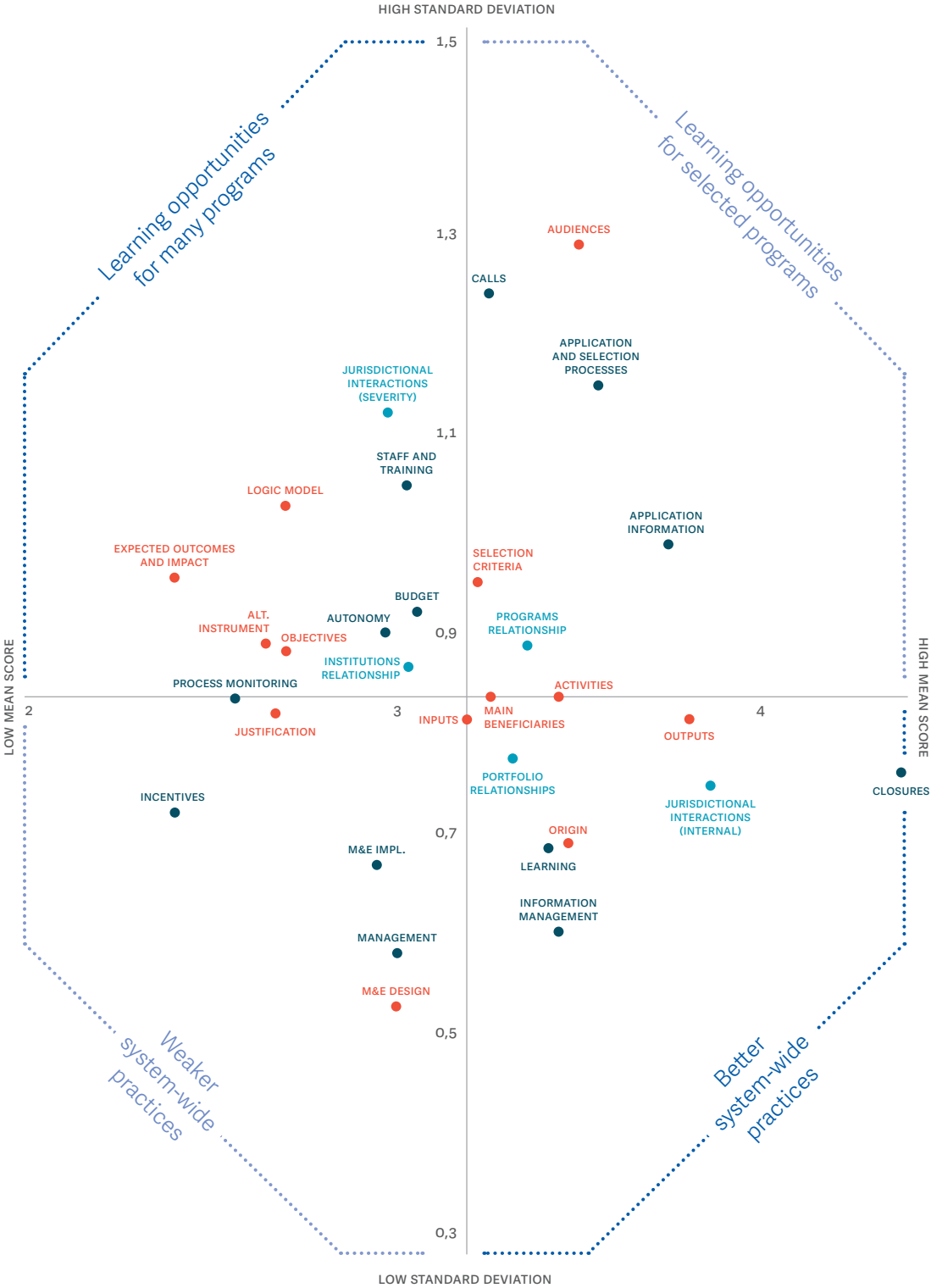
\*Other policy frameworks

**The variation of scores within each category indicates areas requiring systemwide improvements as well as learning opportunities between programs.** Figure 2.4 plots scores in each category against two metrics: (i) mean score, plotted on the horizontal axis; and (ii) standard deviation, plotted on the vertical axis. The axes intersect at the median point of each metric. The data points above the horizontal axis have higher variability, meaning that those categories contain more diverse practices. For example, on average, all programs score 3.5 in the *Audiences* category, but within this category scores vary on average by 1.3 points. The greater variation of scores in these categories points to an opportunity for lower-scoring programs to learn from the practices and experiences of higher-scoring programs. Conversely, the data points below the horizontal axis are more uniform and could be interpreted as systemwide practices. For example, the average score in *M&E design* is 3, and within this category scores deviate from the average only by around half a point. Higher scores appear relatively consistently in categories plotted in the green area of the chart, such as *Closures*, *Jurisdictional interactions (internal)*, and *Outputs*. These categories may be considered as better systemwide practices. On the other end of the spectrum are categories with consistently lower scores, such as *Incentives*, *Justification*, *M&E design*, and *M&E implementation*, which point to systemwide practices that should be rectified across most if not all programs.

**Support for industry-science collaboration appears to be more challenging to design and implement.** Overall scores for programs whose purpose is to foster collaboration are 10 percent lower than scores for programs that exclusively target the business sector and 17 percent lower than programs targeting the research sector (Figure 2.5). Programs fostering collaboration include Strengthening Capacities for Research, Development, and Innovation (STRIP) and Support to Development of Centers of Competence (CEKOM), two programs that faced numerous challenges during design and implementation. For example, the key design issue with STRIP is that it puts the research sector in the position of chief beneficiary, as it intends to push research toward commercialization (see also section 3.1). While this approach may yield some results, they are likely to be sporadic, since researchers do not necessarily have a sense of the private sector's innovation demands. On the implementation side, calls do not have predictable calendars due to delays in management processes and project proposal selection. CEKOM, the other program aimed at fostering collaborations, had an extremely complex design, with four collaboration models with different compositions and aid intensity.

**While programs dedicated to the research and business sector on average score better than programs for collaboration, they also are more inconsistent.** Overall scores range from 2.8 to 4.1 for research funding programs and from 2.5 to 4.1 for business innovation funding programs (Table 2.1). The highest-scoring research program, the Unity through Knowledge Fund (UKF), excelled in design and program implementation mechanisms. The program had a fully developed logic model with formal inputs, activities, and outputs. The program used paid international reviewers from a preselected pool of experts. The evaluation took two to two and a half months, and the entire selection process took around five months. UKF does, however, have room for improvement with respect to resource availability and staff incentives. Areas for improvement in lower-scoring research programs, such as Centers of Research Excellence (CoRE), Support to Researchers for the Application to European Research Council (ERC) Programs (ERC Support), and Partnership in Research (PAR), were mainly in program design, particularly in categories related to origination, justification, and consideration of alternative interventions. On the

**Figure 2.4** Most areas display a high variability of scores

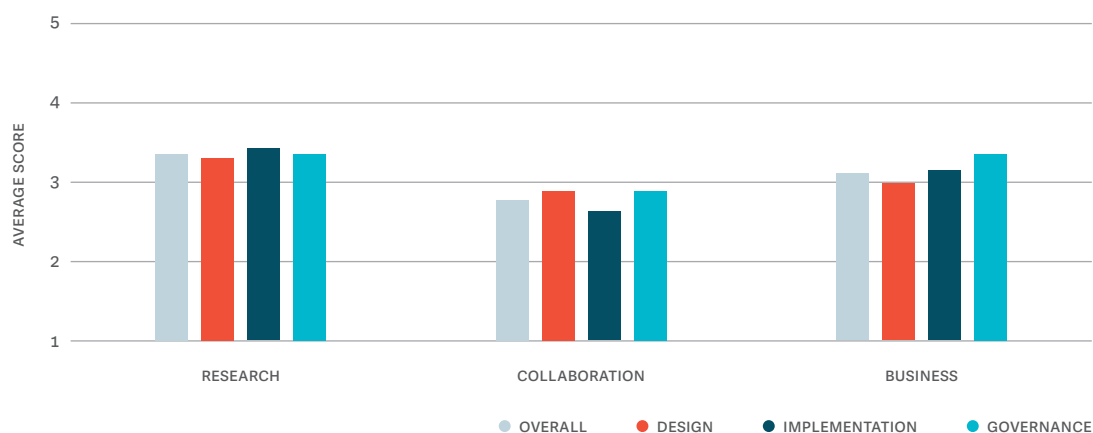


Source: Staff elaboration.

● DESIGN ● IMPLEMENTATION ● GOVERNANCE

business sector side, programs such as the Proof of Concept (PoC) scored highest; it is a long-standing program with a proven track record of creating a pipeline of R&D-based innovation. Despite this, however, in recent years its scope of work diminished to cover only private sector projects rather than both public and private projects, as originally envisaged. This effectively cut funding by public research organizations for proof of concept projects. Its funding has also become uncertain, making it difficult to plan calls more than a year ahead. Lower-scoring programs for business innovation tend to struggle with program design and resource management, but they perform somewhat better on program implementation mechanisms.

**Figure 2.5** Support for industry-science collaboration has been more challenging to design and implement



Source: Staff elaboration.

**Table 2.1** Distribution characteristics of overall scores by beneficiary type

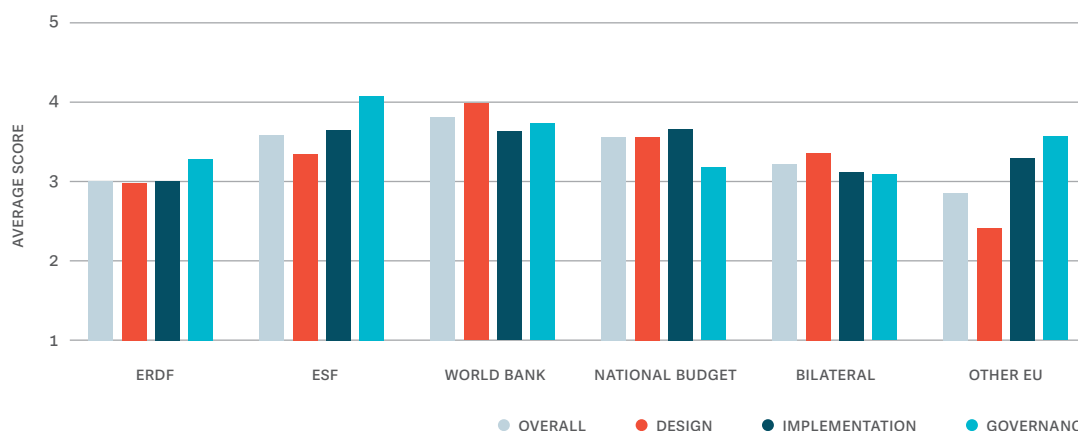
	AVERAGE	STANDARD DEVIATION	MEDIAN	MINIMUM	MAXIMUM	RANGE
Research	3.3	0.4	3.3	2.8	4.1	1.3
Collaboration	2.8	0.1	2.8	2.6	2.9	0.2
Business	3.1	0.3	3.0	2.5	4.1	1.5

Source: Staff elaboration.

**The source of funding has an important bearing on program functionality.** Programs funded from ERDF on average score lower than programs financed from national budget funds, bilateral agreements, and the World Bank (Figure 2.6). Overall scores within each financing type fluctuate only to a limited degree, except for programs funded from the national budget (Table 2.2). As ESIF funds in Croatia are administered, more layers of administrative capacities for managing the funds are required. In general, all ESIF funds (ERDF, ESF, CF, and others) are delivered through so-called operational programs (OPs). OPs provide a detailed plan and justification for spending ESIF funds. Sections of the OPs may be drawn up for a specific region in the country or for a thematic objective (for example,

Research and Innovation).<sup>5</sup> Some design and implementation flaws may be traced back to the Operational Programme Competitiveness and Cohesion (OPCC), which is used as the basis for designing every program. Programs must have an explicit link to OPCC, which sometimes results in lack of clarity in program objectives and lack of focus. Another issue affecting ERDF funding (and OPCC) specifically are the Common National Rules (CNR).<sup>6</sup> The CNR define processes and procedures for preparing and implementing funding programs under OPCC and are issued by MRDEUF as MA.<sup>7</sup> Some of these processes (such as preparing program or grant award procedures) are overly complex and take a long time to complete. Further, some important program elements, such as selection criteria, are standardized and set in advance, leaving research, development, and innovation (RDI) support programs little room for flexibility and customization. This is not an issue in programs funded by the national budget, bilateral agreements, or the World Bank, which do not have such requirements.

**Figure 2.6** Scores vary depending on the source of funding



Note: The ESF category consists of only three programs: PZS, DOK1 and STEM scholarships. “Other EU” denotes transnational programs designed centrally at the EU level. These include ERC Support, Eureka, Eurostars, and B-Light.

Source: Staff elaboration

**Table 2.2** Distribution characteristics of overall scores by funding type

	AVERAGE	STANDARD DEVIATION	MEDIAN	MINIMUM	MAXIMUM	RANGE
ERDF	3.0	0.2	3.0	2.5	3.4	0.8
ESF	3.6	0.2	3.5	3.4	3.9	0.5
World Bank	3.8	0.3	3.8	3.5	4.1	0.5
National budget	3.5	0.4	3.6	2.9	4.1	1.2
Bilateral	3.3	0.0	3.3	3.3	3.3	0.0
Other EU	2.9	0.2	2.8	2.7	3.3	0.6

Note: The ESF category consists of only three programs: PZS, DOK1 and STEM scholarships. “Other EU” denotes transnational programs designed centrally at the EU level. These include Support to ERC Support, Eureka, Eurostars, and B-Light.

Source: Staff elaboration.

<sup>5</sup> [https://ec.europa.eu/regional\\_policy/en/policy/what/glossary/o/operational-programme](https://ec.europa.eu/regional_policy/en/policy/what/glossary/o/operational-programme).

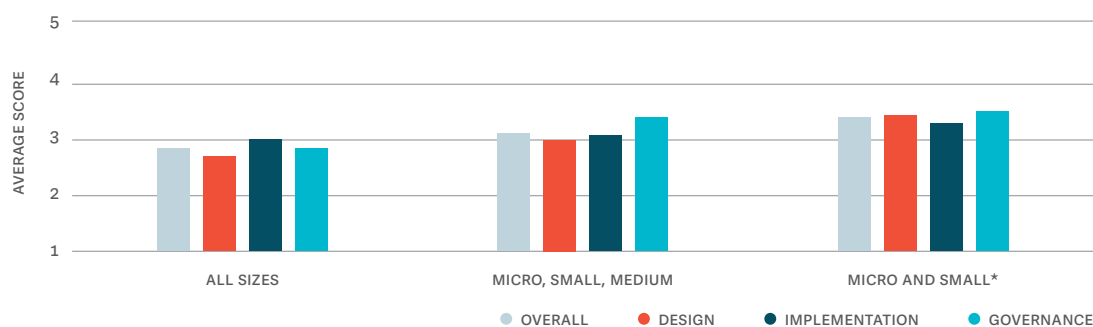
<sup>6</sup> Section 4.2 provides a detailed review of the CNR in Croatia.

<sup>7</sup> See Section 4 for more details.

**The low score of centrally managed transnational EU programs is an anomaly likely due to lack of awareness of the programs’ design considerations.** Three of these programs, denoted as “Other EU” on the graph, include Eureka, Eurostars, and B-Light; designed at the EU level, implementation is facilitated by HAMAG-BICRO. The low overall average score is driven primarily by a low program design score, one dimension of program functionality that local authorities cannot control. Aside from HAMAG-BICRO, other institutions responsible for innovation policy making appear to have ownership of these programs. Local authorities appear to have perfunctory understanding of program designs, and program participation seems mechanical, since the added value and fit of the program with Croatia’s overall policy mix are not clearly presented through well-developed reasoning.

**Targeting a narrower set of firm-size classes is associated with better scores than programs with no size-based targeting.** Out of 22 programs with firms as main beneficiaries or partners, 6 are open to firms of all sizes; 15 target micro, small, and medium enterprises; and one is dedicated to micro and small firms. Figure 2.7 breaks down score aggregates by size class of target beneficiaries. Programs that target micro, small, and medium enterprises have a 9 percent higher average overall score than programs open to firms of all sizes; a 12 percent higher design score; a 2 percent higher implementation score; and a 20 percent higher governance score. Only a few programs have a low overall score in this category (Table 2.3). Higher scores of micro and small firms should be interpreted with caution, however, since they represent the results of only one program, the Croatian Venture Capital Initiative. Nevertheless, size-based targeting appears to be beneficial to the programs’ functionality. Program design is more focused and better adapted to the needs and capabilities of smaller firms. This was one of the key areas of improvement identified in the Analysis of Quality and Coherence of the Policy Mix (World Bank 2019).

**Figure 2.7** Programs with narrower targeting of beneficiaries perform better



\*The micro and small category includes only one program, the Croatian Venture Capital Initiative.  
Source: Staff elaboration.

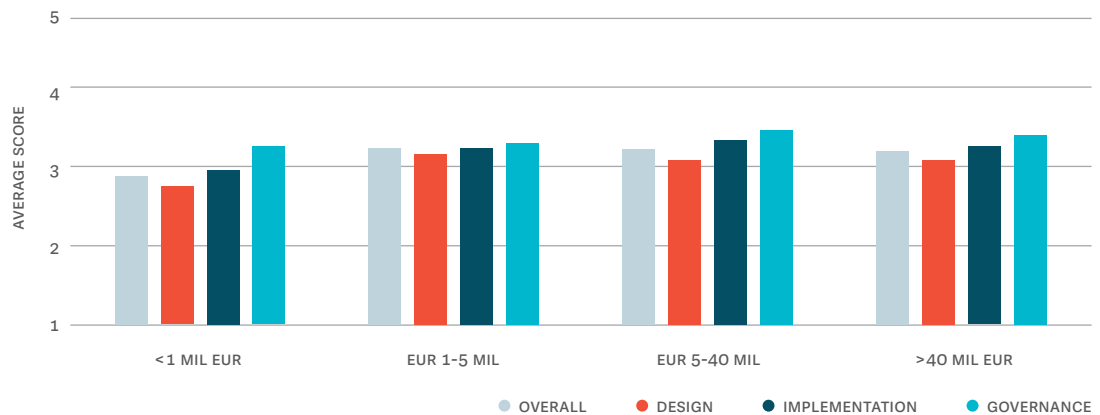
**Table 2.3** Distribution characteristics of overall scores by beneficiary size

	AVERAGE	STANDARD DEVIATION	MEDIAN	MINIMUM	MAXIMUM	RANGE
All sizes	2.8	0.3	2.8	2.6	3.4	0.7
Micro, small, medium	3.1	0.3	3.0	2.5	4.1	1.5
Micro and small	3.4	0.0	3.4	3.4	3.4	0.0

Note: The micro and small category includes only one program, the Croatian Venture Capital Initiative.  
Source: Staff elaboration.

**Very small programs lag small, medium, and large programs in terms of design and implementation.** Figure 2.8 presents the disaggregation of scores by budget size. Programs with a budget in the range of EUR 5–40 million are the most common, hence their greater variability (Table 2.4). Only three programs in the sample had a budget under EUR 1 million between 2014 and 2020. Two are Eureka and Eurostars, and while these are very large programs that finance STI at the EU level, the Croatian contribution is very small. As discussed earlier, the lack of control over program design and uncertain understanding of the programs’ fit in the overall policy mix, lead to overall lower scores for these programs. The third program in the smallest group provides support to researchers for applications to ERC programs. The program budget is EUR 650,000, and it had four calls starting in 2017. On the design side, it falls short of best practices in program origin and justification due to lack of strategic articulation and a formal in-depth analysis of what would lead Croatian scientists to apply for ERC grants. Program design could be more informed by stakeholder engagement. The program does not have a developed logic model and recording of results is informal.

**Figure 2.8** Small programs have lower scores



Source: Staff elaboration.

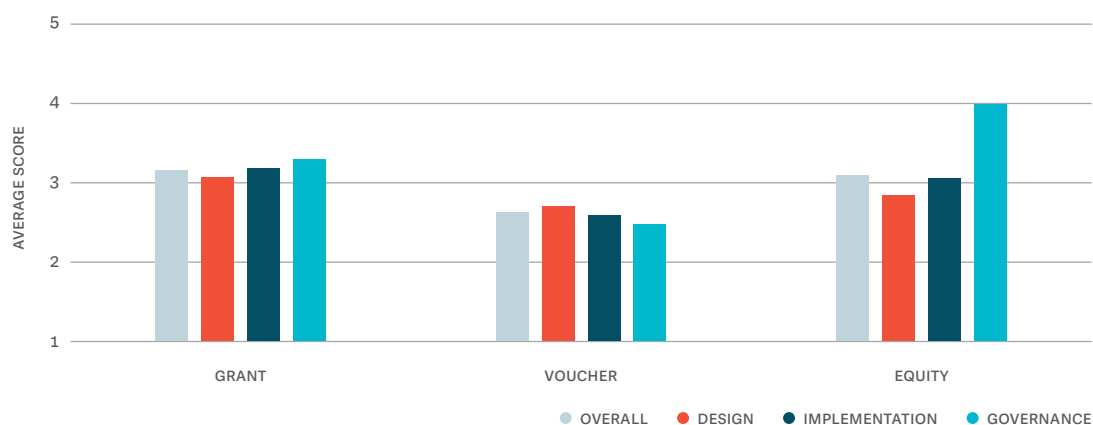
**Table 2.4** Distribution characteristics of overall scores by program budget size

BUDGET SIZE	AVERAGE	STANDARD DEVIATION	MEDIAN	MINIMUM	MAXIMUM	RANGE
<1 mil EUR	2.9	0.1	2.8	2.7	3.0	0.4
EUR 1–5 mil	3.2	0.3	3.3	3.0	4.1	1.1
EUR 5–40 mil	3.2	0.4	3.2	2.5	4.1	1.5
>40 mil EUR	3.2	0.2	2.9	2.6	3.2	0.5

Source: Staff elaboration.

**Grant schemes appear to have better design, implementation, and governance.** Grant schemes have a 0.5 higher overall average score; better design, implementation, and governance (Figure 2.9); and greater variability in scores (Table 2.5). Out of 36 analyzed programs, 33 are grants, 2 are vouchers, and one is an equity instrument. The use of voucher schemes has encountered some difficulties. Voucher schemes are relatively new instruments for Croatia’s policy makers, having come into use only in the last two years. The first voucher scheme, Innovation Vouchers for SMEs, scores moderately well on program origin, justification, and portfolio relationship, although it lacks a formal process. The second voucher program, Quality Labels, is not as well justified. The rationale for creating the program is informal without specific identification of market or system failure. In addition, it does not target the firms that would benefit the most from the instrument. Scores for both programs are somewhat lower when it comes to the logic model, which is implicit, and there is no explicit catalogue of inputs and activities necessary to reach program objectives. In addition, both programs unnecessarily limit the pool of service providers (PROs in the case of Innovation Vouchers and the Chamber of Economy or Chamber of Crafts in the case of Quality Labels). These restrictions significantly limit the functionality and efficacy of the voucher schemes. Even though the application and selection procedures are much simpler than for grants, take-up has been low, and the budget of both programs remain underutilized. Management quality is on the weaker side. Intermediate bodies in charge of the vouchers (as well as grants for businesses) face both external and internal pressures, and staff autonomy is very limited. And while staff appears to be sufficient to manage both voucher programs, they have virtually no training opportunities and very limited incentives related to the program.

**Figure 2.9** Grant schemes score better than voucher schemes



Note: Only one program is included in the Equity category and only two in the Voucher category.  
Source: Staff elaboration.

**Table 2.5** Distribution characteristics of overall scores by intervention mechanism

INSTRUMENT	AVERAGE	STANDARD DEVIATION	MEDIAN	MINIMUM	MAXIMUM	RANGE
Grant	3.2	0.4	3.1	2.5	4.1	1.5
Voucher	2.6	0.0	3.0	3.0	3.0	0.0
Equity	3.1	0.0	3.4	3.4	3.4	0.0

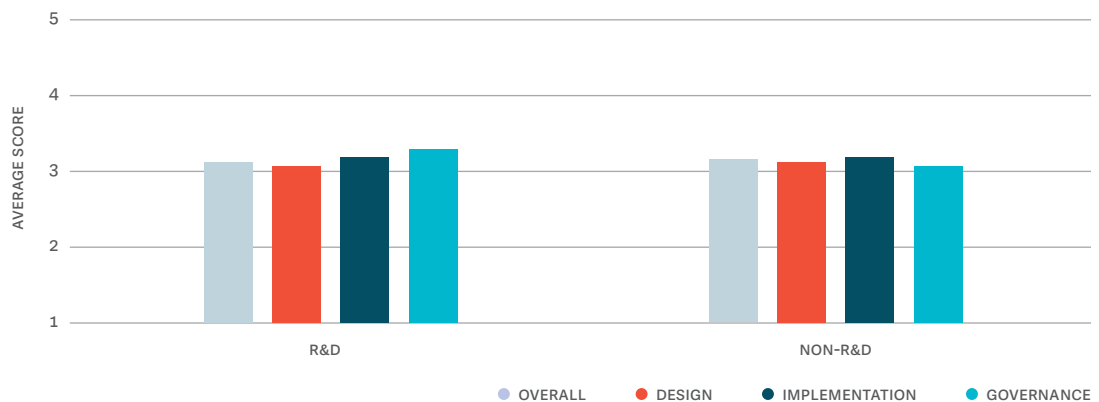
Source: Staff elaboration.



**On average, both R&D and non-R&D programs perform moderately well.** The analyzed sample contains 26 R&D programs and 10 non-R&D innovation programs. At first sight, no significant differences appear between the performance of R&D compared to non-R&D programs (Figure 2.10). R&D programs have a much higher variability, however, ranging from 2.5 to 4.1, while overall average scores for non-R&D programs are concentrated in a narrower range (Table 2.6). This may be because non-R&D programs are managed by only two institutions (MEEC and HAMAG-BICRO), while R&D programs are implemented by multiple institutions.

**Disparities within the performance of R&D programs can be illustrated with two examples.** One of the best-performing R&D programs for businesses is *CVCI*. *CVCI* provides funding for a stage of development during which the risk of failure is very high and thus constitutes a market failure. The program supports lower technology readiness level (TRL) stages, which fits well with the rest of the policy mix and potentially creates a pipeline of projects for other R&D programs. On the other end of the spectrum, the lowest-performing R&D program is Commercialization of Innovations in Entrepreneurship. The program provides support for commercializing R&D results developed internally in SMEs or through technology transfer activities. The market failure and justification for government intervention are insufficiently articulated, however. Typically, government intervention would be warranted at the commercialization stage only in exceptional circumstances. Further, the program makes no clear connection to related programs, such as Increasing Development of New Products and Services from Research and Development Activities (IRI), which somewhat overlaps in terms of eligible activities. The commercialization program also faced significant implementation challenges, with issues procuring expert reviewers at the project selection stage.

**Figure 2.10** No clear difference in the performance of R&D vs. non-R&D innovation programs



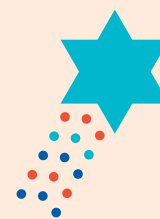
Source: Staff elaboration.

**Table 2.6** Distribution characteristics of overall scores by investment type

	AVERAGE	STANDARD DEVIATION	MEDIAN	MINIMUM	MAXIMUM	RANGE
R&D	3.1	0.4	3.0	2.5	4.1	1.5
Non-R&D	3.1	0.2	3.1	3.0	3.9	0.9

Source: Staff elaboration.

## Box 2.1 Smart innovation policy: The case of Israel



**Israel, a small country with 9 million inhabitants and a long history of conflict, has become a global leader in RDI.** At 4.6 percent of GDP in 2017, Israel has the highest gross expenditure on R&D (GERD) in the world. The Global Competitiveness Report 2019 ranks Israel as the eighth economy in the world in terms of innovation ecosystem, ahead of Japan, Taiwan, Switzerland, and Singapore. Israel is also home to over 6,000 tech companies and 350 R&D centers of multinational corporations and has the highest density of start-ups in the world. The World Bank facilitated a study visit to Israel for Croatian government officials, focused on learning about Israel's experiences establishing its innovation ecosystem.

**Government interventions were crucially important for the development of Israel's high-tech industry.** Israel's unique path to success was influenced by investments in defense R&D in the 1980s and an inflow of highly educated migrants from the Soviet bloc. The big leap in R&D activities occurred in the 1990s, fueled by the creation of several government programs. As an example, incubator services combined with royalty-bearing grants have worked well in Israel. In the early 1990s the government initially invested in ten incubators throughout the country. Incubators screen projects for financing for up to two years. The projects had to go through the steps of registering a company, developing and protecting intellectual property, proving feasibility, etc. Within four to five years more than 70 projects had raised private capital to continue operations for at least another two years. Although a number of projects failed, leading to 100 percent loss of the investment, many survived, most had moderate returns, and a select few were outstanding (so-called unicorns).

### **Lessons learned from these interventions include:**

1. *Identify* market failures correctly. Governments need to be prepared to invest in early stages of development, where the risk of failure is the highest, but public institutions are often reluctant to make such high-risk investments. The key is to accumulate a portfolio of projects with sufficient critical mass such that the overall risk is reduced, even though individual projects may fail. Beneficiaries whose ideas fail are allowed to reapply with other projects, while fraud is punished in a strict manner.
2. *Diversify* interventions. Public programs support ideas at different stages of development, life cycle, and sectors. The original policy approach has been to support high-tech innovation, regardless of the sector. This is because it is difficult for the government to predict what will be "the next big thing." Today, this approach is complemented by flagship projects in frontier fields driven by the scientific community.
3. *Ensure* predictability. Support programs should be well-known, limited in number, available at regular intervals, and easy to plan around. Long-term commitment and consistency in public support were garnered through evidence from impact evaluations demonstrating programs' effectiveness.

**Long-term commitment to higher-level policy objectives and coordination ensured coherence and consistency in the policy mix.** Building the innovation ecosystem and achieving favorable outcomes required a multidecade commitment to R&D spending. Having a centralized institution, the Office of the Chief Scientist at the Ministry of Economy, with

a mandate to fund and coordinate innovation support was an important success factor. Funding is merit-based and allocated relatively quickly. Solid M&E and impact practices helped keep government informed on the return on investment, making it very difficult to reverse policy, regardless of who is in power. A high level of awareness of a common nation-building agenda helped foster coordination of innovation policy across government.

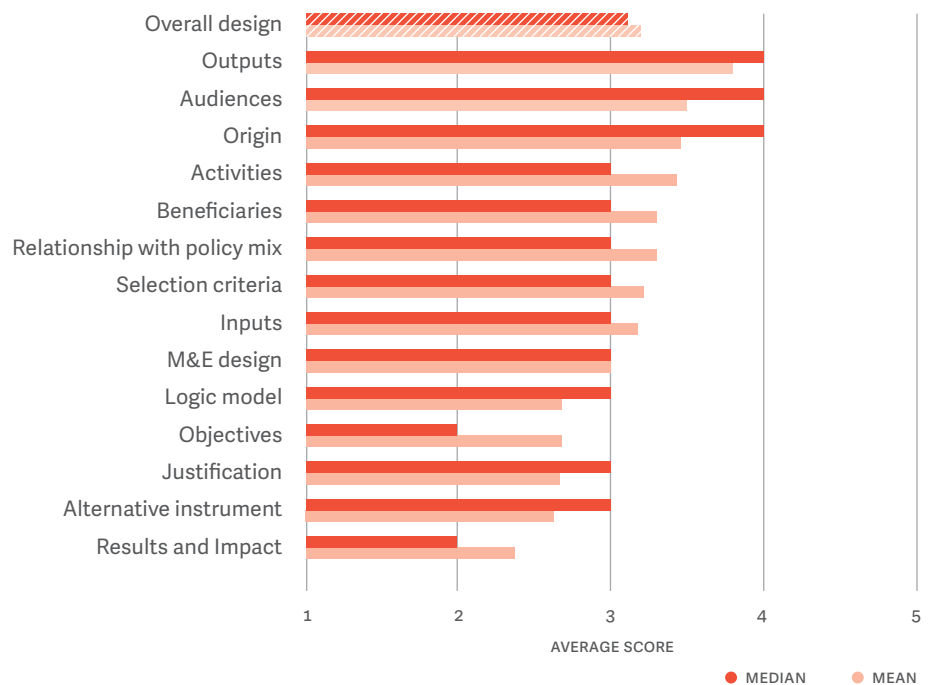
Source: Staff elaboration.



## 2.1 Design

**The purpose behind program design reviews is to explore programs' origination, substance, and embedded theories of change.** Ideally, a program should result from a systematic origination process (as opposed to being ad hoc), and the intervention should be rooted in a solid diagnosis. The program design score is based on the analysis of 14 areas. Each of the design categories (listed in Figure 1.1) is benchmarked against best practices based on a distinct set of criteria, and the design score is the simple average of individual scores in each area. The average score for program design is a little over 3, with varying scores in individual design areas (Figure 2.11). Specifically, the median score for outputs, audiences, and program origin is 4, while for objectives and outcomes and impact the median score is 2.

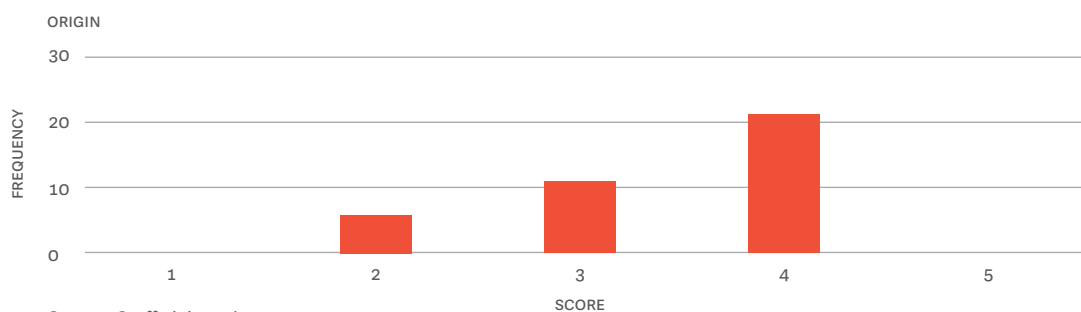
**Figure 2.11** Scores in program design and its components



Source: Staff elaboration.

## 2.1.1 Origin

**Figure 2.12** Half of the programs score very well on program origin



Source: Staff elaboration.

**Program origin is close to best practices in most cases, with minor shortcomings.** Half of the programs have a score of four (Figure 2.12). This category aims to capture the quality of program origination across three dimensions: (i) formality of the process, (ii) incorporating lessons learned, and (iii) link to strategic objectives. Most programs in Croatia originate with a formal and structured process and are linked to strategic objectives, either outlined in OPCC 2014–2020 or the Smart Specialization Strategy (S3). No programs received full marks, however, since in many cases the diagnostics are informal or used in a perfunctory way or understanding or institutional memory regarding their role is insufficient.

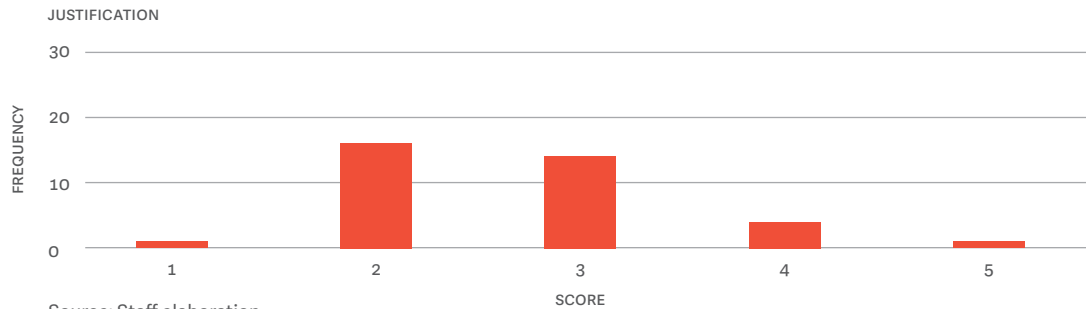
### BEST PRACTICE CHECKLIST — Origin

- The program’s origination process is formal and includes use of a diagnosis or a strong foundation. This stands in contrast to subjective preference or arbitrary origination of program. (This should not be confused with the justification, which addresses the content of the diagnosis and its relation to the program purpose.)
- If the program is a continuation of another program, it must be adapted and improved. This improvement should be based on a reasonable diagnosis and evaluation of the previous version of the program.
- The program is explicitly linked to strategic objectives relevant to the policy area, as opposed to constituting an end in itself or a continuation of activities by administrative inertia or organizational culture.



## 2.1.2 Justification

**Figure 2.13** Scores on justification are medium to medium-low



Source: Staff elaboration.

**Program justification is insufficient in most cases.** Most programs have medium-low to slightly higher scores. (See Figure 2.13.) Unlike program origin, which is more concerned with the process of creating a program, the justification category assesses whether the substance of the program addresses a market or system failure. An excellent program justification is rooted in a specific diagnosis that identifies a legitimate reason for the government to intervene.<sup>8</sup> It also provides a well-documented, evidence-based justification for the intervention, with quantitative data, where appropriate. Only one program, CEKOM, met the standard that warranted a high score. The program was justified based on the findings of a 2013 study conducted by Organisation for Economic Co-operation and Development (OECD) that identified a market failure related to industry-science collaboration and collaboration among firms. Most programs had only a superficial and implicit link with the market or system failure to be addressed, however. For example, Commercialization of Innovations in SMEs scored poorly here, since government intervention at the commercialization stage is difficult to justify. One program that scored medium-low on justification was IRI, the largest R&D support program in Croatia. While market failure undeniably exists in the area of private R&D investment, the program favors later stages of development, where the risk of failure is arguably lower.



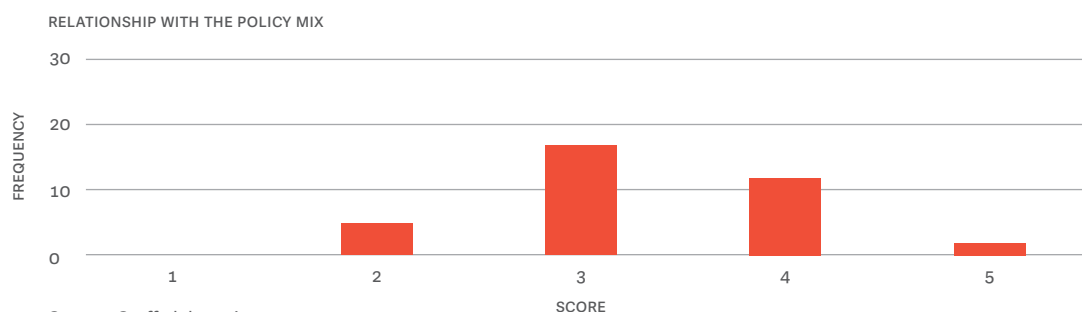
### BEST PRACTICE CHECKLIST — Justification

- The intervention is justified based in a specific diagnosis.
- The diagnosis refers to a market or system failure and states the causes that justify and explain the intervention.
- The references to market or system failure are well-documented with evidence and, where appropriate, quantitative data.

<sup>8</sup> See section 3.2 for more details.

## 2.1.3. Relationship with the policy mix

**Figure 2.14** Portfolio relationships are usually informally considered



Source: Staff elaboration.

**Portfolio relationships are typically acknowledged and understood, although sometimes their consideration is informal.** Portfolio relationships aim to capture the extent to which the existing policy mix is considered during program design. Most programs are developed with awareness of other similar or complementary programs, but this is usually an informal consideration without rigorous diagnostics about their conflicts, complementarities, or overlaps (Figure 2.14). For example, programs such as Certification and ISO and Other Norms fit into a larger scheme of business competitiveness programs and complement each other. Coordination of the portfolio remains informal at the level of programming and setting the financial allocations for programs, however, without any serious consideration given to the optimal innovation policy mix. SIIF and STRIP score somewhat better because of the high awareness of the issue, and coordination exists among other programs led by the MSE. These programs fall short of best practices, however, because the level of awareness and coordination declines for programs outside MSE. One program that received the top score (STEM Scholarships) demonstrated a high level of coordination and communication with related programs, facilitated because all related activities (e.g., meal and dormitory subsidies) are conducted under the same MSE directorate.

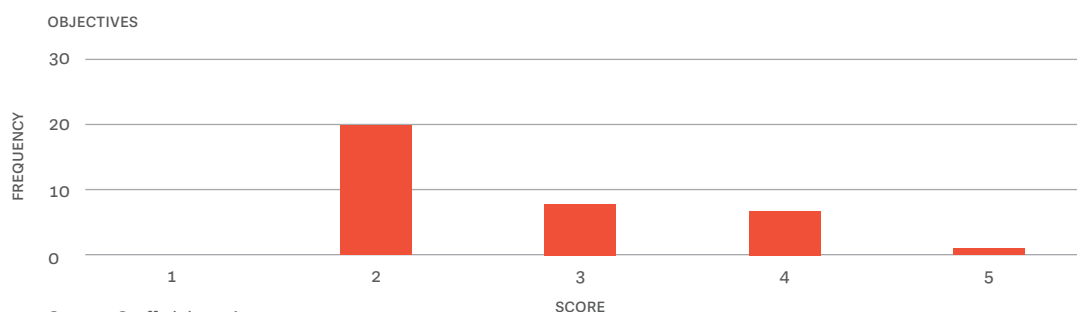
### BEST PRACTICE CHECKLIST — Relationship with the policy mix

- Operation of the program is given explicit consideration with respect to all other related and relevant programs.
- Diagnostic analysis at the design stage takes account of potential conflicts, complementarities, or overlaps with other relevant programs.



## 2.1.4 Objectives

**Figure 2.15** Program objectives are not well-formulated



Source: Staff elaboration.

**Program objectives are in many cases formulated very broadly.** More than half of the programs score medium-low in this respect (Figure 2.15). Program objectives should be defined to reduce ambiguity and conflict. To achieve this, objectives must be clearly and explicitly stated and linked to desired systemic changes. They must be realistic and both observable and measurable, as opposed to abstract and generic. A cluster of relatively weak objective-setting practices may be found in programs dedicated to business innovation. The objectives of these programs are to a large extent taken from OPCC thematic objectives. The link between the interventions themselves and the stated objectives is indirect at best, however. For example, the objective of the Internationalization of SME Operations program is defined as being to contribute to the increase of the OP-level indicator: Share of companies that export. This objective is unlikely to be achievable through this scheme alone, however, since the program provides funding only for participation in international fairs or other business-to-business (B2B) encounters and market research. No diagnostic behind the program design indicates that insufficient participation in fairs and market knowledge are the main bottlenecks for SME exports. Another issue with program objectives is that they are often too broad and diluted. For example, the stated objective of the SIIF program is to “increase market-oriented R&D activities by supporting collaborative projects of scientific organizations and disseminating results to the business sector in order to address market deficiencies resulting from insufficient investment in R&D and raising the level of high quality R&D activities in the Republic of Croatia.” Since the program only allows partnerships between higher-education institutions (HEIs) and public research institutions (PRIs), a connection to increasing market-oriented R&D and R&D spending in the business sector is missing. The program would benefit from a more streamlined and focused objective that reflects better its contribution to the STI policy mix (i.e., supporting research excellence through collaboration in applied research).

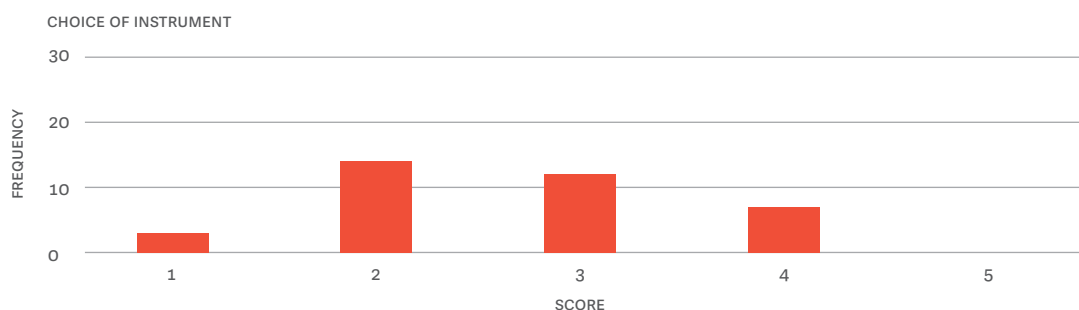


### BEST PRACTICE CHECKLIST — Objectives

- Explicit objectives and goals that connect this instrument to desired higher-level changes (e.g., productivity, knowledge base).
- Objectives should be measurable and achievable.

## 2.1.5 Choice of instrument

**Figure 2.16** Alternative instruments are not considered often



Source: Staff elaboration.

**Consideration of alternative instruments is rare and informal.** Most programs score low-medium or medium in this dimension (Figure 2.16). Programs typically use grants by default, without serious consideration given to other support instruments or even alternative policies for addressing the explicit or implicit objectives more efficiently or effectively. The concentration of instruments in grants may be crowding out other forms of investment, such as early-stage equity investment by business angels. Further, a financial instrument such as a conditional or a convertible loan would make more sense than a grant if the aim is to support commercialization of new products or services.<sup>9</sup> The consideration of alternative instruments builds upon the identification of a market failure and includes trade-off analysis of various intervention mechanisms. One good example of providing due consideration to alternative instruments is the Croatian Venture Capital Initiative, which was based on an ex ante assessment of three different instruments: loans, guarantees, and venture capital. In addition to carefully considering alternative intervention mechanisms, examining alternatives for other elements of a program, such as the main beneficiaries or types of activities supported, is also advisable. In the case of the Croatian Venture Capital Initiative, for example, it would be beneficial to contemplate different target populations to maximize program efficacy.

### BEST PRACTICE CHECKLIST — Choice of instrument

- Consistent justification supports the instruments used to eliminate market or system failure.
- The cost trade-off between the instrument used and other alternative instruments has been considered.
- The instrument used is based on international best practices, but the differences in the local context that may affect its functionality have been considered.

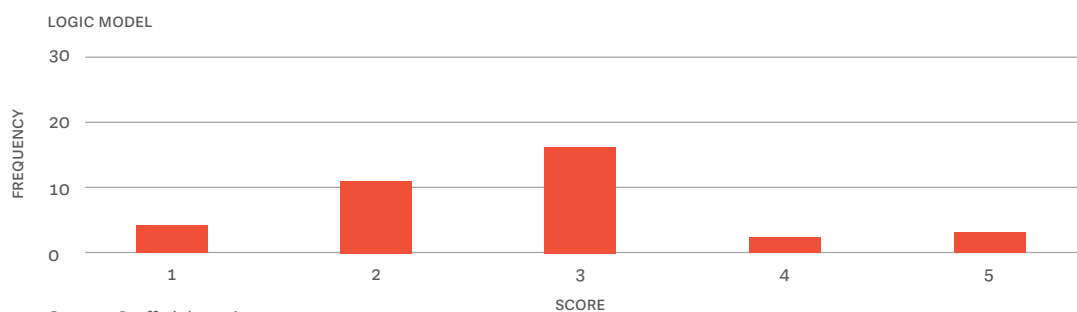


<sup>9</sup> A combination of grants and financial instruments could also be an option.



## 2.1.6 Logic model

**Figure 2.17** Logic models are mostly implicit



Source: Staff elaboration.

**The use of explicit logic models is rare.** The logic model helps to articulate the theory and assumptions that explain how inputs, activities, and outputs lead to outcomes and impacts and affect specific stakeholders and audiences. By explicitly outlining these elements, policy makers can identify gaps in the design and mitigate risks in the achievement of program outputs and objectives. They also support good practices in monitoring and evaluation. The use of logic models had been more widespread in the past, but they were largely abandoned in the 2014–2020 period, when they stopped being required in the ESIF funding framework. Only a few programs are close or on par with best practices (Figure 2.17), mostly because they are required by the funding partner (e.g., the Swiss Cooperation Program). Most programs funded from ESIF have an implicit logic model.<sup>10</sup> Moreover, the program logic appears to be defined more on the side of outputs and outcomes, without full consideration of inputs and activities. Nonetheless, awareness of the need for this program element seems high. As one of the complementary activities under the Croatia PER in STI, the World Bank is helping innovation authorities, at their request, to develop a theory of change for each of the programs. The intention for this work is that it will be taken forward for the next financial perspective and any future programming.



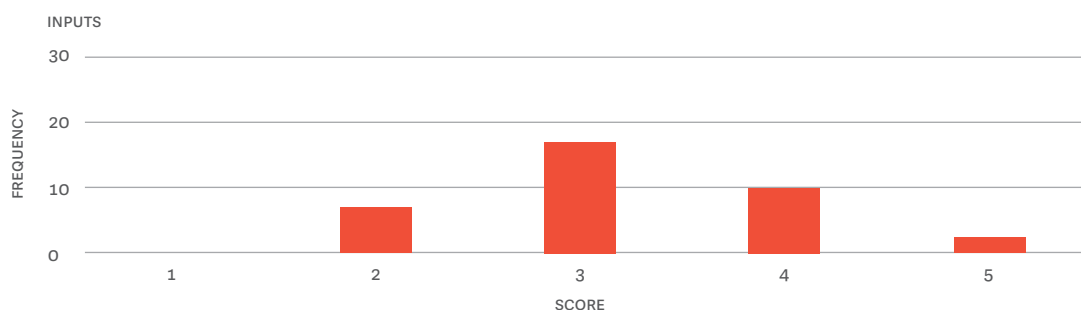
### BEST PRACTICE CHECKLIST — Logic models

- Explicit and defined logic model stated in a formal document (not only for pro forma legal requirements).
- If an explicit logic model does not exist, at least an implicit one does.
- The framework is high quality in terms of its articulation and feasibility.
- The logic framework is used and updated regularly.

<sup>10</sup> See section 3.3 for more details.

## 2.1.7 Inputs

**Figure 2.18** The role of financial and nonfinancial inputs is recognized in most programs



Source: Staff elaboration.

**The role of inputs, both financial and nonfinancial, is recognized in most programs.** Financial inputs include budget allocation; nonfinancial inputs include supervision time, development of documents, and equipment. A full accounting of all inputs is necessary for the logic of the instrument to be feasible, as it allows proper planning and estimation of resources for implementing the program. More than half of the programs are rated 3 or higher (Figure 2.18). Most program managers are aware of inputs beyond the obvious (e.g., shared and nonfinancial resources) and of their role in the logic of the program/instrument (i.e., their alignment with objectives and outcomes). Their role is not explicitly and fully articulated, however. Better examples include cases where an effort is made to explicitly identify inputs but without specifics or cost accounting. This is the case in programs such as SIIF, STRIP, Research Projects and Installation Research Projects. Introducing a cost dimension to inputs would help authorities estimate whether running a program is even worthwhile (i.e., whether the benefits provided to subsidy recipients are greater than the costs of designing and implementing a certain scheme).<sup>11</sup>

### BEST PRACTICE CHECKLIST — Inputs

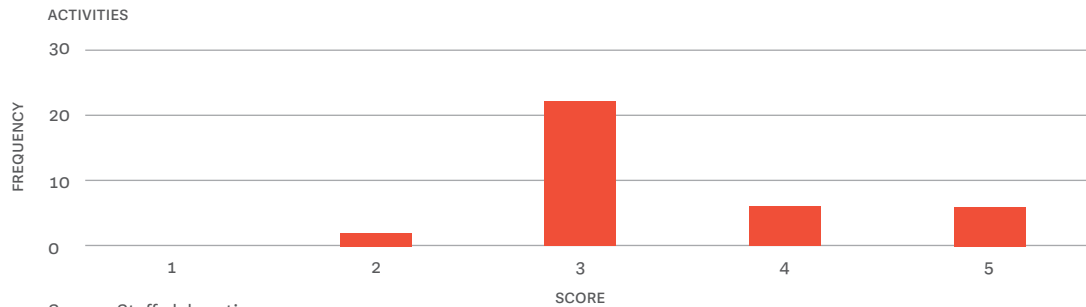
- Inputs are explicitly mentioned and consistent with the logic model.
- Inputs include all or most of the resources needed to achieve the objectives.
- Program administrative and operation costs are registered and accounted for.
- Cost indicators at all different levels are registered and accounted for (e.g., per beneficiary, per implementing unit, and so on).



<sup>11</sup> Authorities are aware of the importance of balancing inputs, outputs, and outcomes and are working within Component 3 of the Croatia PER in STI to capture these effects. The results of the analysis are due in late 2020.

## 2.1.8 Activities

**Figure 2.19** Activities are identified but rarely catalogued



Source: Staff elaboration.

**Necessary activities are identified and planned but are rarely catalogued and exhaustive.**

Over half of the programs plan for activities beyond calls, such as outreach and promotion activities, earning a score of 3 (Figure 2.19). In exceptional cases, an exhaustive list of activities is catalogued and has a predefined timeline. For example, the Tenure Track Pilot Programme and the Croatian-Swiss Research Programme have a documented, explicit, and exhaustive list of activities. While a standard list of activities is also identified for ERDF-funded programs in the grant procedures defined in the CNR, this does not constitute a full and exhaustive list of activities. Each program is different and may require additional steps (such as procurement of reviewers during the selection process). Failure to identify such activities may result in delays and inefficiencies in the process.

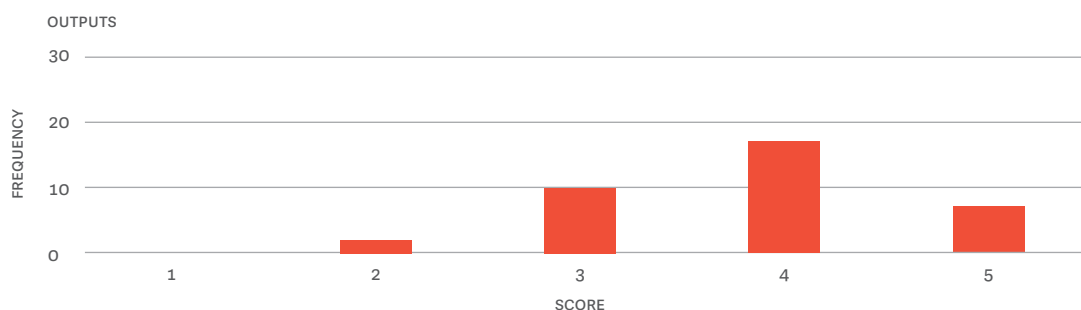


### BEST PRACTICE CHECKLIST — Activities

- All activities needed to achieve objectives are identified and catalogued.
- Activities are consistent with inputs and outputs (that is, all activities have a purpose and help to reach the desired outputs).

## 2.1.9 Outputs

**Figure 2.20** Products and outputs are well-identified, with minor discrepancies compared to best practices



Source: Staff elaboration.

**Most products and outputs are explicitly identified, with some gaps in terms of connection with outcomes.** Products and outputs are intermediate steps in the causal mechanism leading to desired changes in the system. More than half of the programs score medium-high or excellent (Figure 2.20). For most ESIF-funded programs, outputs are clearly identified, measurable, and related to indicators at the OP level (for example, number of companies receiving support, number of contracts signed, and so on), with some additional products that account for desired outcomes of specific programs. The very best programs have an explicit link between outputs and desired outcomes, as opposed to having more generic and indirect links.

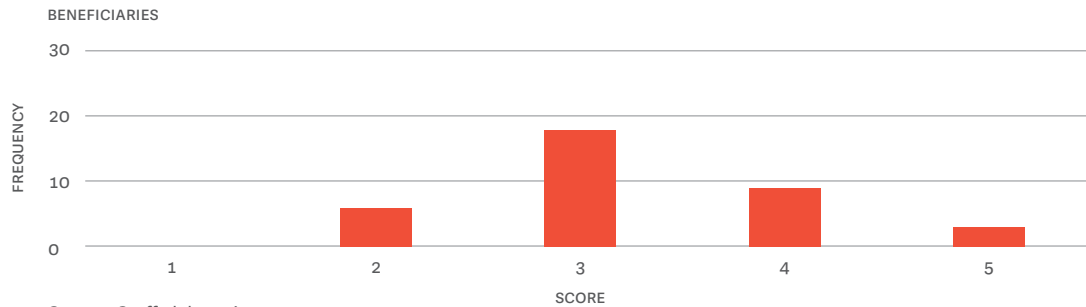
### BEST PRACTICE CHECKLIST — Outputs

- A complete list of products/outputs is explicitly identified.
- Outputs are consistent with activities and are understood as necessary stepping-stones toward desired outcomes.
- Products/outputs of activities are operationalized and measurable.



## 2.1.10 Beneficiaries

**Figure 2.21** The category of beneficiaries would benefit from a greater degree of targeting



Source: Staff elaboration.

**Main beneficiaries are explicitly identified, but usually as a broad group, with little effort towards targeting.** Figure 2.21 presents the distribution of scores for the identification of the main beneficiaries. The design of the policy instrument should explicitly identify the target population, in line with policy goals. The IRI program is a typical case from the middle of the distribution. While the program explicitly defines eligibility criteria, its target population is very broad (including large firms, consortia, and SMEs). S3 thematic priority areas also do not work very well as targeting mechanisms, as they include 13 broad areas of activity (so-called sub-thematic priority areas) and two crosscutting areas. On the other end of the spectrum, some programs are too restrictive when identifying main beneficiaries. For example, programs that finance basic and applied research often exclude private research organizations or firms performing R&D. The only eligible applicants are entities registered in the Registry of Research Organizations. The *Analysis of the Quality and Coherence of the Policy Mix* (2019) detected this issue, recommending that requirements to access the Registry of Research Organizations be streamlined so that firms performing R&D can access more R&D funding programs.

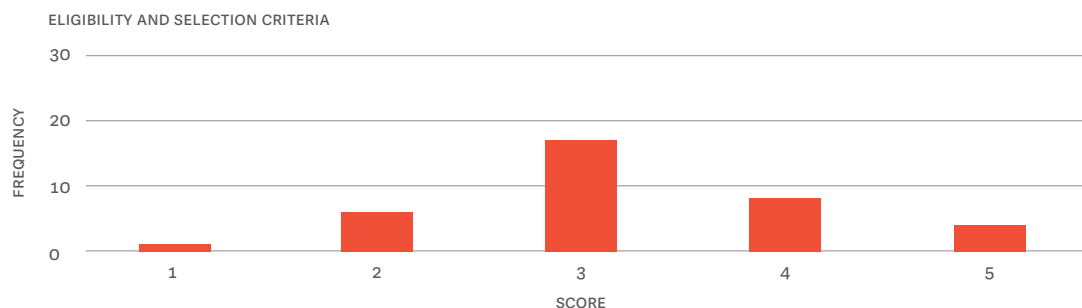


### BEST PRACTICE CHECKLIST — Beneficiaries

- Main beneficiaries are explicitly mentioned and consistent with the logic of the instrument.
- Specific target beneficiaries are identified that can maximize program success beyond generic categories. Sufficient specificity in identifying these strata of beneficiaries should be present.
- Targeting criteria are explicit and quantitative measures are used to identify them.

## 2.1.11 Selection criteria

**Figure 2.22** Selection criteria are transparent but sometimes lack effectiveness



Source: Staff elaboration.

**Selection criteria are clear and transparent but at times ineffective at reaching populations with higher potential for impact.** This area relates closely to the previously discussed area, Beneficiaries, in that it further narrows the population of main beneficiaries, targeting those most likely to produce the intended policy effects. Figure 2.22 presents the distribution of scores for eligibility and selection criteria. Mechanisms are in place to ensure that selection criteria are transparent and available to applicants as part of the call for project proposals. These could be made even more transparent by providing the selection criteria and methodology during the public consultation process. Further, ES-IF-funded programs are hindered by formal requirements to include mandatory criteria as defined by the CNR. Program managers have limited flexibility within this framework, as each specific criterion must be integrated into one of the general criteria defined by the CNR. In some cases, this can even contribute to negative selection. For example, some programs awarded additional points to projects from less developed regions, undermining the principle that project quality should be the predominant factor in the selection process. Other programs, such as IRI, had selection criteria that favored applicants closer to commercialization. This is counterintuitive considering that the risk of failure is higher at earlier stages of R&D, and the role of the government is to reduce that risk. Support in later stages of development, while it may be justified in some cases, introduces the possibility of crowding out private investment. Box 2.2 presents the results of a systematic review of selection criteria.

### BEST PRACTICE CHECKLIST — Selection criteria

- Selection criteria are consistent with the objectives and conceptual framework.
- A coherent selection mechanism captures the target population with higher potential impact.
- The criteria are transparent, simple, and easy to understand.





## Box 2.2 Selection criteria analysis

**A detailed review of selection criteria was conducted with the aim of identifying common trends and patterns in the use of individual criteria and criteria types.** The review entails building an exhaustive inventory of criteria and indicators used in the 2014–2020 programming period. The inventory allows for better understanding of the use of selection criteria by systematizing information on common indicator types, scoring weights, and thresholds. This enables a comprehensive analysis of the use of selection criteria at the system level and of their fit with overall policy goals. Of the 36 STI support programs covered in the Functional and Governance Analysis, 21 are funded from the ERDF and are subject to OPCC CNR, 4 are funded from the national budget, 3 from the ESF, 2 from bilateral agreements, 2 from a World Bank operation, and 4 are pan-European programs.

**Value for money carries the highest number of points in ERDF-funded grant programs, followed by the financial sustainability of the project.** Out of 21 ERDF-funded programs, 18 are grant instruments and subject to standard categories of selection criteria as defined in the CNR. All of them use criteria related to five areas: value for money, financial sustainability, design and maturity of the project, implementation capacity of the applicant, and horizontal issues (Figure 2.23).<sup>12</sup> These areas are designated as obligatory in the CNR and must be applied in all programs. Of these, most points are allocated to value for money (around 30 percent on average), followed by financial sustainability of the project (17 percent) and design and maturity of the proposal. Innovativeness, an optional criterion, is not used as often as would be expected (in only five programs).<sup>13</sup> Criteria related to balanced regional development are used frequently (in 13 out of 18 grant programs) and in some cases carry a significant amount of points (up to 20 percent).

**Value for money cannot always be straightforwardly defined in RDI programs and sometimes leads to an adverse selection.** The CNR define value for money as a quantified ratio of the expenses needed to achieve target values of output or outcome indicators. In practice, indicators of value for money often focus on the contribution of the project to program outputs and outcomes without taking into account the expenses needed to achieve targets. Measures defined in this way, however, do not account for the quality of the outputs and outcomes of a given project. The issue is even more pronounced in some cases in which the criteria, although quantitative, are not clearly defined in terms of measurement, leaving them subject to individual interpretation and thus to potential inconsistency in evaluators' assessments. For example, one criterion may assess whether project outputs are "acceptable" compared to the requested grant without defining thresholds for what is "acceptable" and what is not. Another issue with value for money is that, in some cases, it is used as a proxy for measuring proximity to commercialization and short-to-medium term increases in revenues

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<sup>12</sup> In cases where the call was restricted, the exact indicators used to assess projects were not published, as the full documentation was only provided to preselected beneficiaries.

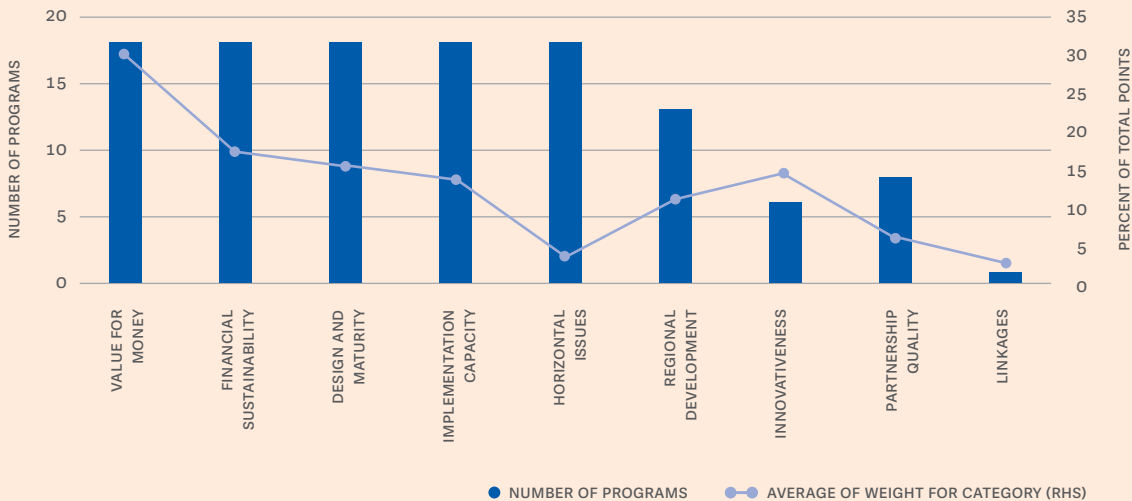
<sup>13</sup> In some cases, this criterion was not applied because it was interpreted as innovativeness in the planned methods of project implementation (innovativeness of the process), due to the somewhat ambiguous name given to the criterion ("innovativeness in the project implementation plan"). In more recent programs, however, this category has been used more frequently to assess innovativeness of products developed.

and profitability. The issue with this approach is that it favors project proposals with weaker arguments for market failure, while projects at earlier, riskier stages of R&D are penalized.

**Using outcome indicators to assess value for money can also result in adverse incentives.**

For example, using the estimated increase in sales revenue in the post-implementation period as an indicator of value for money motivates applicants to use exaggerated and unrealistic estimates to score more points. Given that criteria of this sort are, in many cases, strictly quantitative and do not assess the coherence of the financial projections presented or necessarily put them in relation to the amount of grant requested, higher points are awarded to applicants who simply present higher projections, without capturing actual project quality or realistic value for money. Applicants are discouraged from inflating sales estimates in the Q&A sections of the call, citing penalties for failing to achieve target sales values. It is unclear how beneficiaries could be held responsible for a shortfall in revenues or profitability, however, which depend on a myriad of exogenous factors not under a firm’s control.

**Figure 2.23** Value for money is the most important selection criterion in RDI support programs



**Voucher programs involve the same mandatory criteria prescribed by CNR, but with a different scoring approach.** In the two analyzed voucher programs, quality assessments of projects use “yes/no” questions. A project is supported if the answers to all questions are “yes.” Innovation vouchers and quality label vouchers use questions related to value for money, financial sustainability, implementation capacity, design and maturity of the project, and horizontal issues.

**Programs funded from ESF appear to have more flexibility in setting selection criteria as compared to ERDF-funded programs.** The three programs in this group — DOK1, PZS, and STEM scholarships — all have fully customized criteria. For example, the criteria for PZS include scientific quality (23 percent of total points), impact of the project (23 percent), research and management capacity of the applicant (38 percent), and financial sustainability (15 percent). Applications are graded on a scale from 1 to 5, with mandatory descriptive explanations for scores. In DOK1, applications are assessed based on the capabilities of



the mentor (specifically, scientific activity, mentoring and organizational capacities) and the PhD candidate (based on the level of detail provided in the research plan, activities during PhD studies, feasibility of the career development plan, and coherence between planned activities and expected results). Mentor capabilities and organizational capacities carry a higher number of points. A possible issue may be that assessments are conducted by domestic panels, which can be difficult in Croatia's small scientific community, despite measures to prevent conflicts of interest. For STEM scholarship, applicants are ranked based either on their mathematics grade in the secondary education exit exam (for first-year students) or on the normalized grade average of the students and number of European Credit Transfer and Accumulation System (ECTS) points earned (for second- and higher-year students).

**Programs for researchers funded from the national budget have more flexibility to tailor selection criteria to their own needs.** These programs are implemented by HRZZ. The selection processes for all three programs (IP, UIP, and PAR) are conducted in two rounds. In the first round, selection criteria focus on two aspects. First is the previous track record of the principal investigator (PI). These criteria relate to the PI's capacity to leverage research funds in the past, publication track record (including publications in peer-reviewed journals and international conferences), and teaching and mentoring activities (where applicable). The second aspect focuses on the quality of the proposal itself, assessing the potential of the proposed work and recommending it for review by international reviewers. This aspect is more open to interpretation and requires a judgment call regarding the applicants' accomplishments, the scientific relevance and novelty of the project proposal, and similar issues. In the second round, reviewers must evaluate the proposal in the following categories: scientific quality of the proposal and research relevance; project proposal feasibility; quality of principal investigator; proposal strengths; and proposal weaknesses. Each category requires one or more numerical grades (from 1 to 5); the reviewer is invited to corroborate the assigned grades with descriptive comments and proposes a final grade of *A (proposal is recommended for funding)*, *B (proposal is recommended for funding with minor revisions)*, or *C (proposal is not recommended for funding)*. In the final step, the domestic panel provides a final opinion on project proposals that received two positive reviews, and considers the financial plan, ethical matters, institutional support, supporting documentation, and, if necessary, any other criteria as defined by the Governing Board.

**The one program for business innovation financed from the national budget (PoC) is an example of how selection criteria can be set to target a market failure.** Project proposals are assessed on technical and financial grounds. The technical assessment is based on four criteria: (i) innovativeness and technological risk, (ii) market potential, (iii) quality of project application, and (iv) coherence between budget and planned activities. Each of the four areas is assigned a score from 1 to 5. It is important to note that the criteria reward proposals with high technological risk, that is, projects in which it is unknown whether the idea can be put into practice. This ensures that the intervention targets a market failure (lack of external funding due to high risk). The financial assessment is based on a binary (yes/no) assessment and serves to verify applicants' commitment to securing co-financing, covering losses up to the amount of capital, or registering a firm (if the applicant is a private individual). The financial assessment also serves to verify the budget and eligibility of expenditures.

Source: Staff elaboration.

## Stories from beneficiaries

### Selection criteria



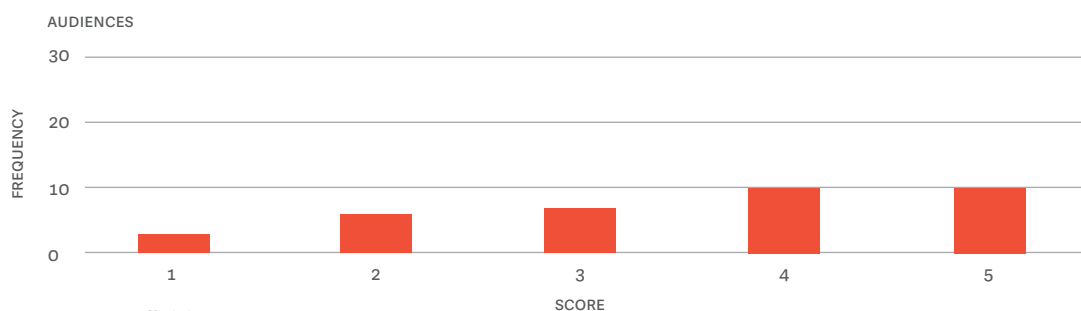
**Numerical selection methods are favored in ESIF funding of R&D in Croatia.** For instance, IRI selection criteria solely use numerical values, with no narrative or descriptive assessment provided to the beneficiary that would substantiate the final (numerical) results. Some beneficiaries suggest using an independent peer review process to elaborate the decision. In case of rejection, they could then also be informed about how to improve the proposal in the future. Peer review is currently difficult to implement because the ESIF national rules require that applications be made in Croatian, which prevents the use of foreign reviewers.

### Takeaways

- Use descriptive, open-ended questions, where appropriate, to provide more flexibility to assess project proposals beyond numerical values. The parameters of assessment should be clearly defined through a scoring matrix and should be transparently published within the call.
- Introduce applications in English so that a pool of foreign reviewers, given adequate remuneration, could be used. This would reduce conflicts of interest and guarantee a merit-based approach, that is, rather than using automated sums, the content would be carefully weighed.

## 2.1.12 Audiences

**Figure 2.24** Awareness of nonbeneficiary audiences exists in most cases



Source: Staff elaboration.

**In most cases, the design acknowledges stakeholders other than target beneficiaries, and channels for systematic engagement exist, although they are not always used.** Over half of the programs score medium-high or high with respect to audiences (Figure 2.24). Audiences include both program beneficiaries and stakeholders not directly participating

in its activities. Nonbeneficiaries often influence the program/instrument as opinion leaders or political positioning or may be part of a broader population of entities expected to receive spillover benefits from the program. Nonbeneficiaries may also be affected by the program or have such perception. Identifying them is critical for proper operation of the program/instrument given the potential impact of their support or opposition on the program's legitimacy or viability. Consultations with stakeholders were conducted as part of the design process of OPCC as a whole (which covers a large number of programs). An example of good audience engagement can be found in the Support to the Introduction of ISO Standards and Other Norms program. The MEEC established a working group with an accreditation agency and the Croatian Standards Institute and collected inputs from service providers during the design process.



#### BEST PRACTICE CHECKLIST — Audiences

- Audiences are explicitly mentioned and consistent with the logic model.
- The program explicitly indicates its effect on nonbeneficiary audiences.



### Stories from beneficiaries

#### Forging an alliance between stakeholders and program managers

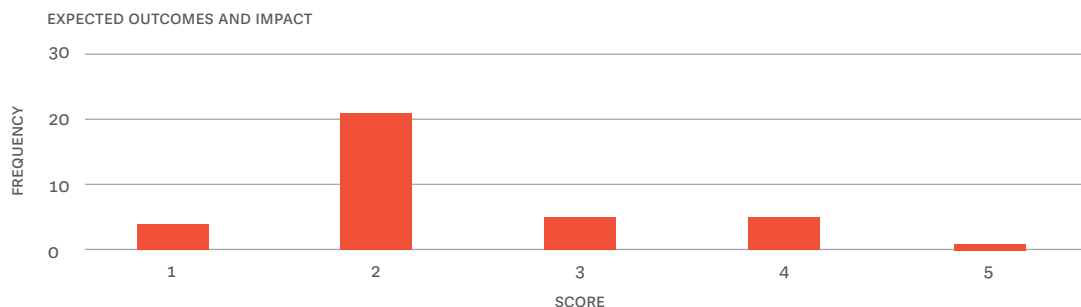
**According to some beneficiaries, although workshops are organized around published calls, the workshops do not clarify issues and provide concrete answers to specific questions; rather they serve as visibility events.** Further, some calls are issued without proper consultation with beneficiaries, which would help ensure calls respond to the current circumstances, demands, and needs of the market. Even during public consultations, comments by potential beneficiaries are not considered and reflected in the calls. This results in a large number of questions and answers that reflect the calls' poor readiness, leading to lengthy processing and belated awarding of funds. Potential beneficiaries can provide valuable input concerning the criteria, terms, and content of calls. Currently, rather than focus on communication of common interests, however, the emphasis is on administration and paperwork to be collected and submitted.

#### Takeaways

- Consult with stakeholders strategically as a means of building partnership in the program community, actively seeking input and feedback from those who know the topic well, that is, well-performing researchers and proven project leaders.

## 2.1.13 Results and impact

**Figure 2.25** Expected outcomes and impact are not fully coherent with program design or measurable



**Expected outcome and impact indicators are explicit, although not fully coherent with program design.** The outcomes and impacts of the instrument are results of the operation that can be determined with observable and measurable evidence of desired changes in the system. They are distinguished from outputs and products in that they are not merely what an activity produces, but an actual change in the state of affairs to a more desirable one. Unlike products and outputs, most programs do not perform well in terms of expected outcomes and impacts.<sup>14</sup> (See Figure 2.25.) For example, the outcomes for the program Innovation in S3, as well as other programs targeting the business sector, are not specific to the program, and most of them are not actually outcomes but outputs (e.g., number of firms receiving support, number of firms receiving a grant, number of firms receiving support to introduce new products to the market, etc.). In this call, only two outcomes were directly related: number of innovative products/services new to the market and increase in revenues from sales two years after the end of the project. No other impacts are defined at the program level. This stands in contrast to some other programs, which define very specific outcomes and impacts, for example, creating an inventory of high-quality innovative projects with a high level of readiness for further technology development and commercialization, strengthening the capacity of the private sector for innovation, bringing more innovations to market, increasing SMEs' competitiveness, and growth and development of knowledge-based companies.

### BEST PRACTICE CHECKLIST — Expected outcomes and impact

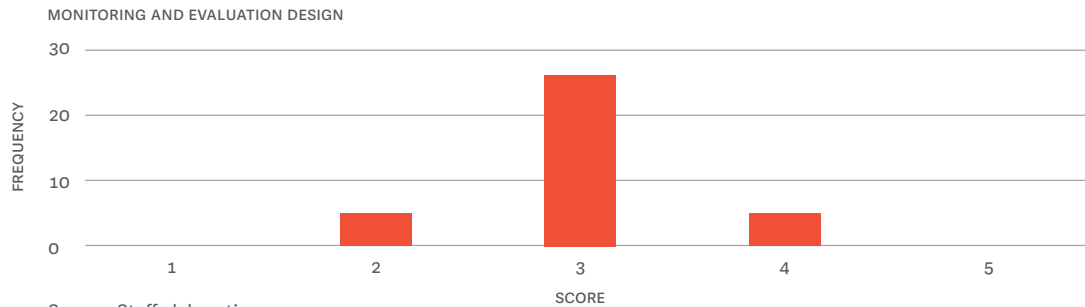
- Expected outcomes and impact are explicitly mentioned and consistent with the logic of the instrument and connected to the system level.
- Expected outcomes and impact are clearly identified with observable and measurable results and specified indicators for assessment.
- Criteria are included for tracking the evolution of outcomes that allow for ending program participation if it becomes clear that program objectives will not be met (as opposed to ad hoc closure at the end of a contract or other extrinsic reason not related to results).
- The expected impacts are integrated coherently with the broader context of R&D policies in the country or region or with other programs of the same agency or jurisdiction.



<sup>14</sup> See section 3.4 for more details.

## 2.1.14 M&E design

**Figure 2.26** M&E design is somewhat adequate but gaps remain compared to best practices



**The monitoring and evaluation system does not fully fit the needs of program managers.**

Most institutions have adequate monitoring systems in place, but with gaps compared to best practices (Figure 2.26). In a majority of the programs, the monitoring function prevails, with relatively little attention paid to evaluation. In ESIF-funded programs, basic monitoring is done at the level of the OP, with a core set of indicators that are sometimes confused with activities and outputs (e.g., number of firms receiving grants), as described in the previous paragraph. These indicators are usually not specific enough to respond to the monitoring needs of individual programs, so programs also include program-specific outcome indicators. Indicators for many programs are incomplete, with missing output, outcome, or impact indicators. For example, the program on internationalization of SMEs through business support organizations tracks only output-level indicators, such as the number of organized business meetings, fair attendances and so on, without defining the desired outcomes and impacts at the program level (such as number of partnerships established, change in export revenues, and so on). Considering that most programs do not have a developed and explicit theory of change, it is unsurprising that some indicators may be missing or that outputs are confused with outcomes.<sup>15</sup> No program was designed with the possibility of conducting impact evaluation at the program level in the future.



### BEST PRACTICE CHECKLIST — Monitoring and evaluation design

- An M&E system is integrated into the instrument from the beginning (in some cases, consideration of future impact assessment requiring baseline).
- If M&E for the instrument relies on external, administration-wide or organization-wide M&E systems, specific adjustments or accommodation of the system must be made to fit the specific needs and aims of the instrument. Practitioners should avoid distorting the program logic to accommodate external bureaucratic requirements that do not favor its functionality.
- M&E indicators should include high-quality operationalizations of outcomes and impacts and should not be narrowed down to indicators of activities or outputs.
- Realistic methods of data collection have been considered for the measurement of indicators.

<sup>15</sup> The revision of the theories of change and associated indicators is part of the work under Component 3 of the Croatia Public Expenditure Review in Science, Technology, and Innovation. The work will result in explicit logic models for each individual support program and suggestions to improve and streamline output, outcome, and impact indicators.

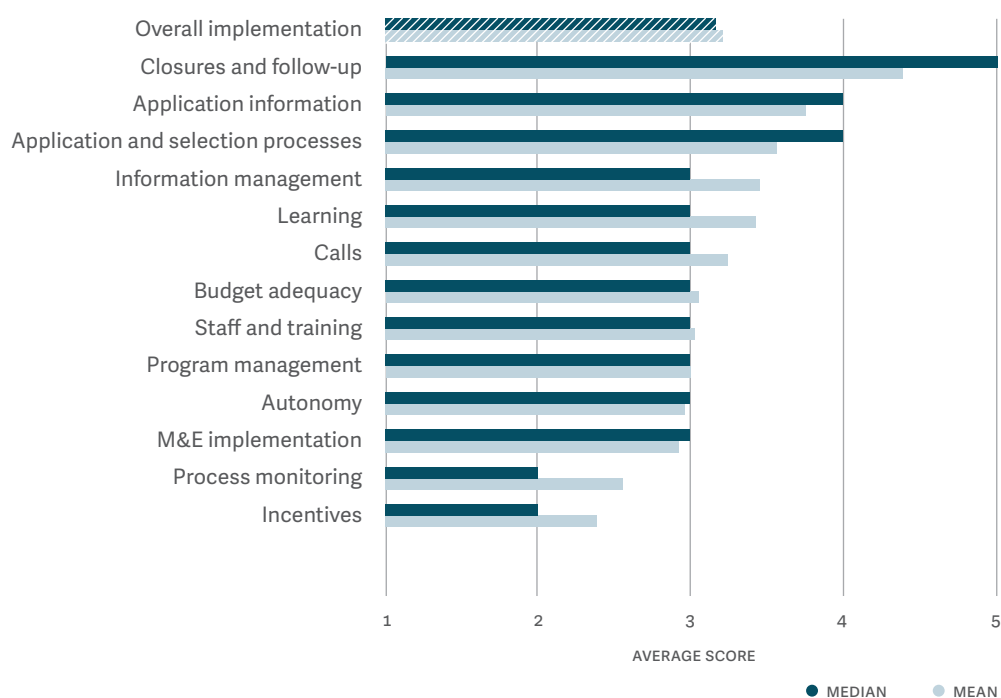
## 2.2 Implementation



**Program implementation is analyzed through 13 dimensions organized into 4 groups.**

The first group consists of a single area and assesses the process of recording evidence from learning during implementation. The second group covers program implementation mechanisms, and the third group focuses on the program’s resources and management quality. The final group looks at M&E mechanisms during implementation. (The full list of dimensions is presented in Figure 1.1.) The results for each dimension are presented in Figure 2.27. Areas related to program implementation mechanisms (such as closures and follow-up, application information, and application and selection processes) score overall better than areas related to resources (such as incentives, process monitoring, autonomy, and program management).

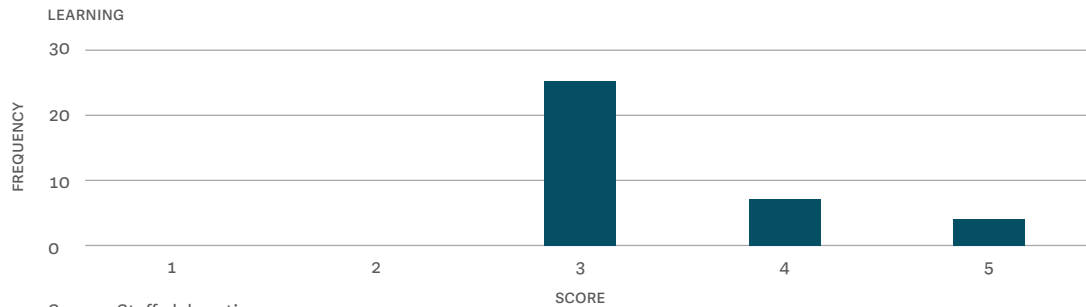
**Figure 2.27** Scores in program implementation and its components



Source: Staff elaboration.

## 2.2.1 Learning

**Figure 2.28** Learning mechanisms are mostly informal and lack proper documentation



Source: Staff elaboration.

**Program learning is largely informal and is, in most cases, undocumented.** The distribution of learning evidence scores is presented in Figure 2.28. Implementation of policy instruments should incorporate procedures that contribute to knowledge retention and learning to improve performance during implementation. Implementing institutions should keep a written record of implementation challenges not addressed in the original design, specific solutions adopted, outstanding issues, and relevant data on how the solution improved performance. In this way, the organization is less vulnerable to loss of institutional memory after any staffing changes. In many cases, however, the ad hoc nature of program adaptation and the lack of documentation reflects a shortage of time and resources. Even when lessons are identified, there is no opportunity to implement them in programs for which only one call takes place (due either to lack of funding or to implementation delays). This limits the opportunity for continuous improvement. In cases where changes and updates to the call are made (for example, to modify the eligibility criteria), long-term learning mechanisms are not made a focus.

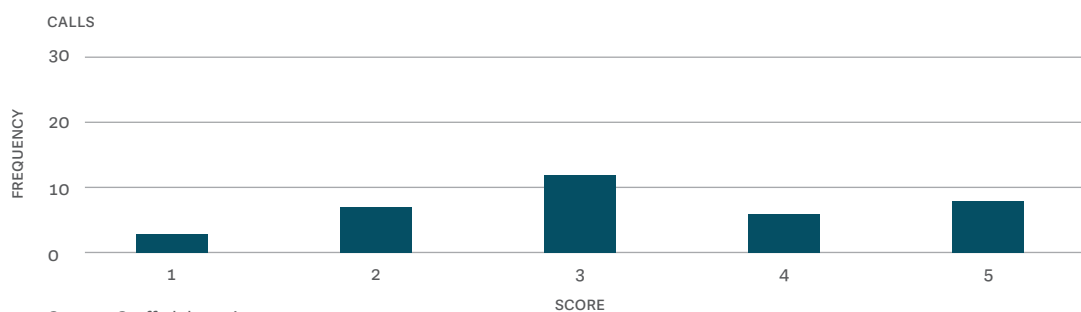


### **BEST PRACTICE CHECKLIST — Learning evidence**

- Changes and improvements are identified, including adjustments to the instrument in operation.
- Obstacles still requiring a solution or implying improvement opportunities are identified.
- Change and learning are formally documented; periodic review processes accumulate data and an improvement plan results.

## 2.2.2 Calls

**Figure 2.29** Calls do not follow a consistent pattern



Source: Staff elaboration.

**Calls are unpredictable and generally do not follow a consistent pattern.** The scores on calls are almost even throughout the distribution (Figure 2.29). While MAs publish indicative annual plans for calls, often these plans do not materialize. An important feature of STI support is a regular and reliable schedule of calls.<sup>16</sup> This allows researchers and firms to plan ahead and focus on preparing a good-quality project proposal rather than rushing to the deadline of a call that may not be published again until several years later. Moreover, regular, frequent calls lead to improvements in the quality of implementation if good learning mechanisms are in place. Lack of predictability of calls appears to be more of an issue for ESIF-funded programs than for programs funded from the national budget. For example, the Research Projects and Installation Research Projects calls are published regularly, usually at the same time of year, and scientists know when and what to expect. This is somewhat counterintuitive, since ESIF funding is fixed for a seven-year period and thus ought to be more stable, while funding from the national budget is subject to a year-by-year process of national budget approval. The uncertainty in year-to-year budgeting is best reflected in the case of the Unity through Knowledge Fund. This is an excellent program by all measures except for calls, which were too few to achieve the program's objectives. The main problem for ESIF-funded programs appears to be not funding instability but that national budget funding allows more streamlined management, administrative processes, and autonomy in programming. Another issue is the use of permanently open calls, like the one implemented in IRI. While this call modality resolves the issue of uncertainty, it creates other problems as grant awards are not based on comparative analysis between projects, but rather on individual evaluation of the merits of each project separately. Further, applications are cut off at an arbitrary point of program oversubscription, which again may penalize projects that arrive later in the process.

<sup>16</sup> See section 3.5 for more details.





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### BEST PRACTICE CHECKLIST — Calls

- If new calls occur that were not envisaged during the design stage, they are well justified and consistent with the program's logic model.
- The number of calls launched is reasonable and consistent with the logic model and objectives.
- Where appropriate, calls are published regularly and have consistent, predictable calendars.



## Stories from beneficiaries

### Predictability and clarity

**Some beneficiaries confirm that the calls lack predictability and continuity, which does not facilitate planning by either public research institutions or the private sector.** Building a project pipeline is costly, and beneficiaries may not have a pool of projects ready to go at any given moment. Moreover, once issued, calls are frequently corrected, requiring beneficiaries to make changes during project preparation. Multiple changes in call plans do not lead to easily accessible financing schemes, especially considering some calls' complexity and the failure to publish calls according to previously announced schedules.

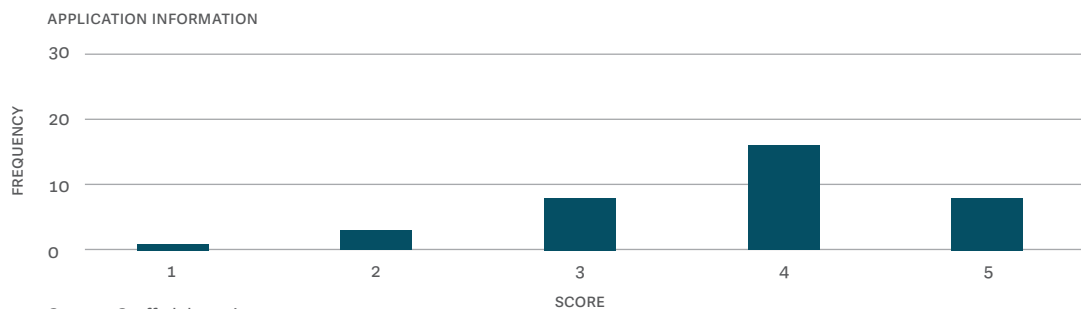
**Beneficiaries report lack of clarity as a significant issue.** The call for IRI 2, published in February 2020, underwent several document revisions, and potential applicants had asked 389 questions as of June 17, 2020, many referring to eligibility of specific costs. Many questions remain unanswered, however, except for a statement that, in the interest of fair treatment of all proposals, responses cannot be made without reviewing a specific proposal. At the same time, cost eligibility is among the most critical aspects for applicants considering applying, and applicants find it worrying when cost eligibility is not clear upfront.

### Takeaways

- Institutions must plan better and issue notifications of calls in a timelier manner, with limited ad hoc changes to the timeline. The experience of one whole ESIF cycle should help. Currently, a yearly schedule is published, but it is frequently amended.
- In the consultation process, in addition to Guidelines for Applicants, other integral parts of the call documentation should be made available for potential beneficiaries to read and comment on. Making them ex ante available would potentially improve the calls and shorten subsequent consultations.

## 2.2.3 Application information

**Figure 2.30** Application information is transparent but, in some cases, burdensome



Source: Staff elaboration.

**Eligibility and selection criteria are mostly clear and transparent, but in many cases the application process is burdensome.** This category addresses the process by which eligibility and selection criteria are implemented and applied and how information about applicants and awards is used and disseminated. The key focus is gauging the complexity of the process and the significance of the burden it might put on applicants attempting to submit viable proposals. For example, applicants should not need to pay external consultants or further intermediaries to navigate the process. Around two-thirds of programs scored medium-high or high in this dimension.<sup>17</sup> (See Figure 2.30.) All programs publish eligibility and selection criteria, as well as lists of beneficiaries and amounts. Q&As are also published, although their presentation formats are often not very user-friendly and the information is not always well-organized. For example, some of the largest programs featured some of the most complex and burdensome application information. In the CEKOM program, all applicants used consultants to help prepare applications. IRI and STRIP also had burdensome application packages. Furthermore, SIIF published Q&As in six separate PDFs organized by receipt date rather than by topic. A large volume of questions submitted to a call indicates lack of clarity in the eligibility and selection criteria.<sup>18</sup> The most challenging issue for applicants, aside from the documentary requirements, is the complex calculation of state aid. In private sector support programs, the most frequently asked questions routinely address state aid calculations.

<sup>17</sup> This result is based on the experience of program managers. Ideally, the score would also reflect feedback from beneficiaries. The World Bank is conducting a survey that will gather information on beneficiaries' satisfaction with the application information as well as their experiences with consultants. The survey results are expected in fall 2020.

<sup>18</sup> For more information related to selection criteria transparency and soundness, please see Section 2.1.11.



## BEST PRACTICE CHECKLIST — Application information

- The eligibility and selection criteria as implemented reach the target population.
- The eligibility and selection criteria as implemented are clear and transparent. Information on the beneficiaries, amounts, and projects financed are published.
- Selection information is collected and analyzed, including lists of applicants, scores awarded to submitted proposals, and other pertinent information related to the submission and selection process. This information is made available to applicants, to the extent general privacy regulations allow.
- Information on eligibility and selection is disseminated appropriately and is consistent with the target population.



## Stories from beneficiaries

### Lack of clarity on cost eligibility

**A group of academic institutions presented to the appeals commission under the MRDEUF with objections related to eligibility of costs.** The objections related to the (i) intensity of the financial support allowing the cofinancing of partner organizations up to 72 percent, instead 85 percent; (ii) costs of commuting for persons working on the project; (iii) work costs of staff in scientific institutions receiving salaries from the state budget; and (iv) indirect costs incurred from R&D activity.

**Three of four of the objections were upheld, illustrating the competence and vigilance needed by beneficiaries.** Had the ruling been negative, the result would have been a significant financial burden for the involved beneficiaries, and many institutions would have withdrawn their applications. The case illustrates the large quantity of regulations and documentation that applicants must study and review when applying for funds to ensure their institutions will not incur unexpected financial burdens.

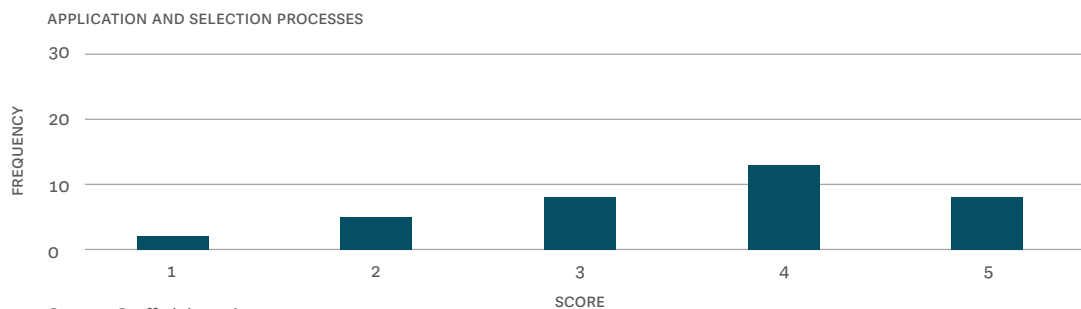
**The institutions managing ESIF funds may have substantially different understanding of the eligibility of critical costs such as those related to personnel.** This is worrisome given that projects may have a large number of staff involved: sometimes more than one hundred people participate in project implementation. One sore point is that the interpretation of ineligibility of staff commuting expenses discriminates against staff employed on EU-funded projects, compared to other staff working at the same institutions. The latter are entitled to all national or institutional rights or the rights guaranteed in collective or employment agreements, which include commuting costs, bonuses, or other rewards. Staff employed on EU-funded projects, however, do not have this option, reducing their incomes as compared to their colleagues. Moreover, these costs are eligible under Horizon 2020 projects and the Interreg Baltic Sea Region Program 2014–2020.

### Takeaways

- Improving the consultation process and the communication concerning the draft call documentation with the potential applicants will help achieve a better understanding of their financing needs.

## 2.2.4 Application and selection processes

**Figure 2.31** The quality of application and selection processes varies across the system

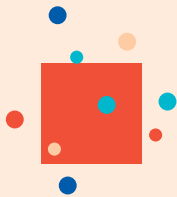


**The quality of application and selection processes is inconsistent across programs.** The range of scores is illustrated in Figure 2.31. Programs showing good scores on this aspect include Innovation Vouchers, Certification, and Support to ISO Standards, STEM Scholarships, and Synergies with Horizon 2020: Teaming, Twinning, and ERA Chairs. These programs are characterized by agile, fast, efficient processes. In the STEM Scholarship program, the selection happens automatically based on preset criteria. The selection process of the Certification and Support to ISO Standards was delegated to HAMAG-BICRO and was completed in less than 120 days. Innovation Vouchers and Synergies with Horizon2020 had an extremely simple, checklist-based selection process that was straightforward to implement. Some of the largest support programs have faced significant challenges in completing the application process, however. The issue is finding adequate experts for selection committees, as R&D projects tend to occur in very niche areas. An additional layer of complexity is that all applications in ERDF-financed programs must be in Croatian, and all project reviews also must be done in Croatian. The Croatian scientific community is very small, which makes it difficult to find appropriate reviewers that are (a) experts in a niche field, and (b) have no conflict of interest. This is a problem that has particularly plagued R&D programs (for both researchers and businesses). Further, appeals may be submitted at any of the five stages of selection, which can further slow the process (see also Section 4). Another set of issues in the selection process occurs in Research Projects and Installation Research Projects. These programs have a two-tier selection process: the first tier consists of domestic panels whose role is to filter out proposals that are deemed unclear or insufficiently elaborated, while the second tier consists of evaluation conducted by foreign reviewers. The final step before the project is recommended for funding is performed by the domestic panel. This setup of the selection process in the first and final instances (domestic panel) creates risk for conflict of interest, considering the size of the country and of the research community in Croatia (see Box 2.3).

### BEST PRACTICE CHECKLIST — Application and selection processes

- The mechanisms used by the agency in the application process are agile, transparent, and responsive.
- The committees responsible for award decisions are composed of relevant and independent experts selected in a justified and transparent manner.
- The mechanism for appealing and conflict resolution is clear.





## Box 2.3 Application and selection process in the HRZZ

**The application process in the HRZZ could be more efficient.** It consists of a combination of electronic and paper-based steps. Proposals and all pertaining documentation, such as institutional support letters, financial plans, and so on, must be written and signed in both Croatian and English. Even though applications are submitted in electronic form, some of the documentation has to be printed by the applicant, stamped, officially signed by the institutional heads, and then rescanned and submitted as the final, officially signed version. The administrative staff is flexible and will usually request that applicants resubmit missing or inadequate documents. This would allow that only administratively fully completed and compliant applications are sent to evaluation. However, any interaction after call closure needs to be minimized and replaced with frequent interaction and support prior to call closure. In case the application is incomplete, the administrative staff has the authority to reject the proposal altogether on the grounds of administrative faults and noncompliance.

**Selection involves a two-step process that combines assessments done by a domestic panel with international peer review.** The two-step evaluation process was modeled, with some adjustments, after the European Research Council (ERC) competitive grant evaluation process. The selection process is conducted in two rounds.<sup>19</sup> In the first round, project proposals go through a binary (yes/no) assessment, at the end of which the application either advances to the second round or is rejected. The first round of evaluation is conducted locally by a review panel appointed by the HRZZ Board and composed of domestic researchers. There are currently 12 panels, one for each research domain. If the project proposal is recommended by the panel, it advances to the second round, which is scored by at least two international peer reviewers. The reviewers are recommended by the panel members and usually several (up to six) are invited to accept the review task.

**After completing the international peer review step, applications return to the domestic panel for the final step of the selection process: ranking the proposals.** During the final step, the domestic panel assesses the quality of the evaluations received by their panel as well as the projects' financial plans and compiles the ranking list separately for each panel or research domain. The rankings take into account the reviewer's final marks (A through C) and use the numeric scores to break ties. Proposals with one or both C marks are rejected. The final ranking is drafted by each panel based on the peer review and the domestic panel's opinion. The proposals of all panels are finally ranked by panel coordinators and recommendations for financing are made to the Governing Board of HRZZ. The funding is approved by the Governing Board, after which the successful applicants are informed and invited to sign the contract.

**Since the Croatian scientific community is relatively small, the pool of researchers eligible to serve on the domestic panel is limited and can create the perception of conflicts of interest.** Panels are appointed for a three-year term. Panelists are eligible to apply for a grant or to serve as a project team member during their mandate, in which case they are relieved from panel duties for that call. Nevertheless, this fact, combined with the small size of the Croatian scientific community, may create the perception of conflicts of interest and undermine trust in the selection process. Frequent changes in researchers' roles — from

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<sup>19</sup> For more details on the selection criteria, see Box 2.2

panel member to beneficiary and back to panel member — may undermine the confidence in the panels' autonomy. The domestic panel plays a significant role: without its approval, a project cannot move to international peer review. The panel is also involved in the financing decision through its role in the ranking of proposals.

## Stories from beneficiaries

### Application and selection processes



**Some beneficiaries report that selection of project proposals takes a very long time and that they receive no information on when the process will end.** According to the CNR, project selection should not take more than four months from the date of closing of the call. However, this deadline often slips and, in some cases, takes much longer. This creates delays for the community of researchers and innovative and knowledge-based firms and puts projects at risk of becoming outdated. In a world where technological progress is fast-paced, many aspects of projects, including the equipment envisaged in the project proposal, can become obsolete. One of Croatia's best faculties by overall performance and in R&D activities once waited 17 months for the results of a project evaluation.

**Prolonged selection processes can end with hasty contracting, putting some beneficiaries under pressure to sign the grant contract without making necessary corrections.** Hasty contracting prevents the beneficiary from reviewing the contract carefully, as the timeframe for signing is sometimes limited to less than three days, even after months have elapsed with no communication from the responsible institutions. Attempts to propose changes to already presented contracts usually fail. Some beneficiaries report that they could not influence the start of project implementation, which was set to kick off within days, catching them off guard after perhaps a year without feedback from authorities.

**Misconceptions at the application stage can lead to expensive problems down the road.** From some beneficiaries' perspective, project applications are best approximations; that is, project concepts are designed to resolve a certain problem with human and material resources based on experience and lessons from implemented projects, as well as cost estimates available from market information. In ESIF projects for R&D activities, budgets are proposed by experienced researchers or private sector R&D leaders. Anecdotally, some beneficiaries report that IBs ask for very detailed explanations of consumables and travel costs by trip, number of trips, and number of people undertaking travel, with supporting documents for calculation. Once this is provided, the estimated costs become part of the contract to be monitored by IBs. This creates problems for beneficiaries, since not all locations, conferences, or number of trips are known at the time of project proposal, just as the consumables cannot be predicted several years in advance in R&D activities. Rather, these unfold over the course of the project and are dependent on and dictated by the results of research.

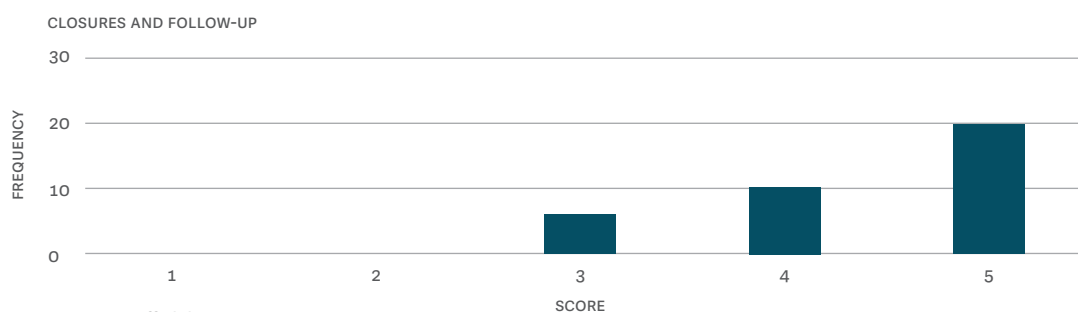
### Takeaways

- The selection process should comply with the service standard envisaged for every step of the process. If this is not possible, responsible bodies should provide regular and timely communication on delays and progress so that users can plan accordingly.

- Interact with applicants and provide feedback on the quality of their applications. This would help to build good relationships with the target beneficiaries and to better understand their needs and capabilities.
- Lack of predictability and high risk are standard characteristics of RDI projects. Such projects require flexibility in the way they are set up, implemented, and accounted for. Having a detailed estimate of all activities under certain RDI projects over the next several years is not a fair and logical request.

## 2.2.5 Closures and follow-up

**Figure 2.32** Project closures are close to best practices



**Closure criteria, final reporting, and post-closure information requirements are fully specified.** Project closures are at the level of best practices in most cases (Figure 2.32). For the best programs in this category, clear rules cover contract termination for non-compliance, and beneficiaries must submit information for up to three years after project end. Programs that received a lower score (such as the Croatian-Swiss Research Program (CSRP) and the Tenure Track Pilot Program (TTPP)) have closure procedures but no post-closure information requirements. Conditions and procedures for termination or discontinuation are a recommended practice, since they prevent waste of resources if the activity does not meet minimum program expectations. Furthermore, since the benefits of participation generally do not end at a project’s closing date, it is a best practice to make post-closure communication and reporting requirements part of the award contract.

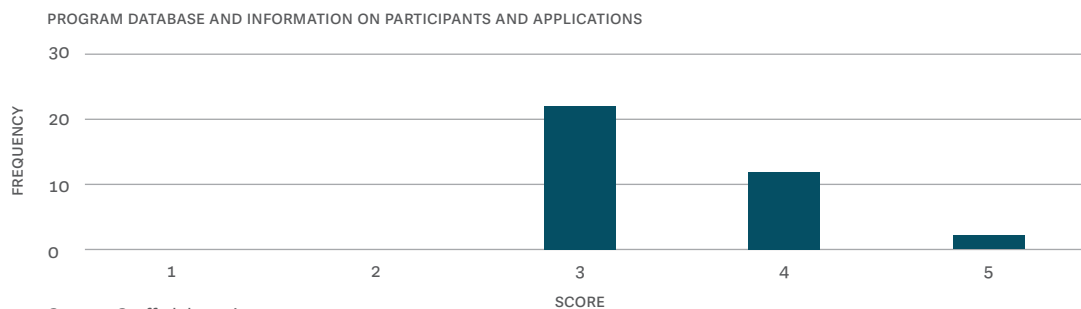


### BEST PRACTICE CHECKLIST — Project closures

- A beneficiary completion/closing report is required.
- Information obtained from the beneficiaries at program end and for a period following is used to learn lessons and measure program impact.

## 2.2.6 Information management

**Figure 2.33** Program databases are systematic but not fully automated



**All programs have systematic data collection, but databases are often incomplete.** All programs score medium-well or higher in this respect (Figure 2.33). This category focuses on information related to applicants and beneficiaries and on whether that information is analyzed and used to enhance the effectiveness of the calls and awards processes. A typical medium-scoring program, BSO, has systematic information gathering, with follow-up three years after project closure. Data collection remains largely informal, however. Programs that scored medium-high in this respect, such as *Research Projects*, *Installation Research Projects*, *Innovation Vouchers*, and others, also had informal data collection and follow-ups using emails and shared drives, but this data was also used to adjust calls and improve program management. The STEM Scholarship program is at the level of best practices, with a fully automated system keeping track of beneficiaries, especially because students are not allowed to receive more than one scholarship from public funds. To enforce this rule, MSE consults with the Ministry of Finance. In addition, other institutions who offer scholarships also consult with MSE (e.g., biotechnology scholarships of the Ministry of Agriculture, scholarships of the Municipality of Zagreb, and others).

### **BEST PRACTICE CHECKLIST — Program database and information on participants and applications**

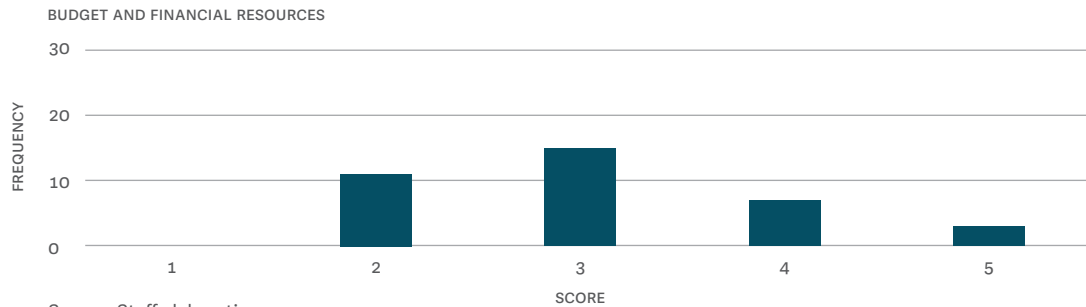
- A database system keeps track of participants, projects, follow-ups, outputs, and other components of the program.
- The system is used to make adjustments to the calls themselves, to increase responsiveness to participants' concerns, and to contribute to the general improvement of program management and design. It is also usable by other programs.





## 2.2.7 Budget adequacy

**Figure 2.34** Low scores on budgets reflect inadequate planning and overbudgeting



**Program budgets and financial resources are inadequate in many cases.** This category captures whether financial resources are adequate to implement the program, as well as execution accountability. Eleven programs are rated medium-low in this category (Figure 2.34). Only one of them (Proof of Concept) scores low due to an insufficient and unstable budget, and some viable projects had to be rejected as a result. The remaining 10 programs (including CEKOM, Innovations in S3 Areas, Commercialization, Synergies with Horizon 2020, and BSO Services) struggled to spend the funding allocated due to lack of interest. This indicates that budget planning is not always aligned with the demand for a specific intervention. The allocation of funds at the start of the programming period at the OP level also contributes to the problem, creating pressure to execute the given budget. In the case of CEKOMs, this led to the program losing 6 percent of its budget, which was allocated to other priorities. This is also likely to happen to other programs that do not meet their spending targets.

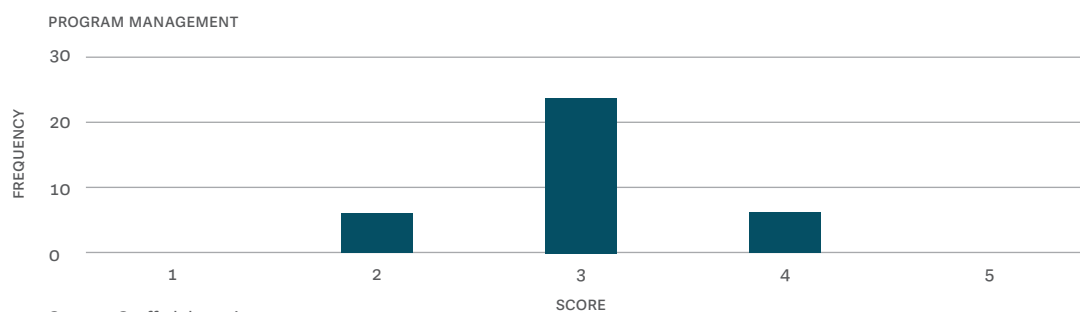


### BEST PRACTICE CHECKLIST — Budget and financial resources

- Budget and financial resources are adequate to implement the program.
- Budget execution responds to program needs and not to the need to execute the entire budget during the budget cycle.
- Program execution and subcontracting entities are subject to accountability standards.

## 2.2.8 Program management

**Figure 2.35** Shortcomings exist in program management and organization



Source: Staff elaboration.

**The majority of organizations have shortcomings in their structure and insufficient adjustment mechanisms.** The distribution of scores is presented in Figure 2.35. ESIF-funded programs divide labor within OPCC among MA, IB1, and IB2, leaving program design and implementation vulnerable to external pressures and delays. The functions of IB1 and IB2 are not the same across all programs (for example, IB1 may delegate the selection process to IB2). From the perspective of applicants and beneficiaries, the fluctuating and complex management structure may be difficult to understand and interact with. Depending on the stage in the application and selection process, the applicant may have to interact with different institutions within the same program (e.g., MSE and CFCA, MEEC and HAMAG-BI-CRO, HRZZ and CFCA). A more streamlined process would facilitate information flow to the beneficiaries. Programs not subject to the ESIF management structure score better in this respect and demonstrate the value of streamlined processes. For example, programs that have a small and agile organizational structure allow greater autonomy and responsiveness. Alongside the organizational structure between different institutions, intra-institutional organization also displays room for improvement. Specifically, frequent organizational restructuring can take a toll on staff morale and communication channels between departments within the same institution.

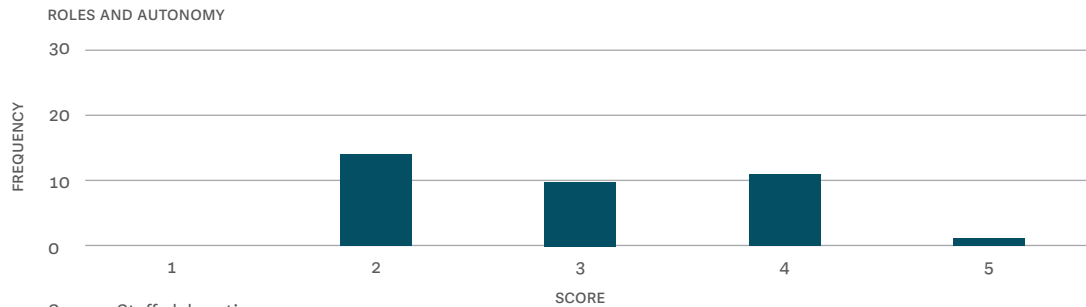
### **BEST PRACTICE CHECKLIST — Program management and organization quality**

- The organizational structure does not have extraneous levels that make information flow to implementers difficult.
- The organizational structure ensures minimization of external and internal pressures in program implementation.
- The organizational structure is reviewed for functional adequacy given the changing requirements of new policies and instruments. Reviews use organizational effectiveness indicators.



## 2.2.9 Autonomy

**Figure 2.36** Roles are sometimes unclear and staff autonomy is limited



**Program managers have limited autonomy to introduce changes to programs.** The responsibility for programs is very diluted. In some institutions program managers are allowed very little discretion and autonomy to introduce necessary changes. At the institutional level, the roles of MA, IB1, and IB2 are strictly defined and steered by the CNR. In many ways, the CNR lack the flexibility to accommodate the specifics of R&D work. For certain matters, introducing change is difficult, and changes require approval by MA, IB1, and OPCC Monitoring Committee.

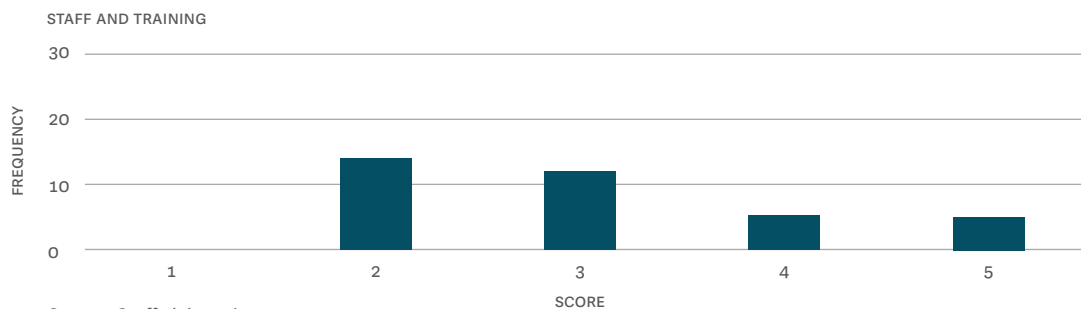


### BEST PRACTICE CHECKLIST — Roles and autonomy

- Roles are clearly defined, and procedures exist for introducing changes.
- The capacity to introduce change is flexible enough to maintain management quality.
- Flexibility is adequate to respond to significant changes and resolve conflicts.

## 2.2.10 Staff and training

**Figure 2.37** Staff and training are inadequate in some institutions



**Some institutions struggle with staff turnover and lack of training opportunities.** Seventy-two percent of programs score medium-low to medium in this dimension (Figure 2.37). Overall, staff have sufficient expertise to perform the tasks needed, but some institutions face staff shortages. Recruitment of personnel is generally uncertain, as the public sector often faces hiring freezes. Institutions like MEEC and HAMAG-BICRO have experienced significant staff turnover and therefore appear to be at full capacity when it comes to workload. In some institutions, staff do not have regular access to training despite the existence of training plans. Continued education allows staff to meet changing demands and provides opportunities for advancement. The lack of training in some institutions has adversely affected staff morale and disincentivized good performance.

### BEST PRACTICE CHECKLIST — Staff and training

- Managers' level of training and experience seems appropriate for the type of program and tasks to be fulfilled.
- The number and quality of the staff is adequate.
- Training and contracting tools exist to improve staff capacity.





## Stories from beneficiaries

### What is the appropriate expertise to run RDI programs?

- “ It looks like there is no room for honest mistakes or errors that could be corrected, rather the authorities managing the ESIF think only in terms of fraud. This has adversely affected the behavior of academia staff and there is a growing reluctance for applying for funds among academic staff. The notion of ‘being blamed’ has hijacked the academic discussion. ”
- “ Things are getting better and we managed to improve some processes. ”
- “ Based on ongoing experience, we will not apply next time. ”
- “ People have the feeling as if the ESIF agencies look at us as thieves instead of people who are set to contribute to Croatia’s welfare through what they are best at. ”

**Anecdotal accounts from beneficiaries suggest a lack of trust between program managers and beneficiaries.** The impression among members of the scientific community is that ESIF landed on unprepared institutional capacity in state administration, where the notion of project management is still subordinate to a hierarchical bureaucratic approach. Performance-based financing and functioning are nascent, and professional project management support — with its accountability and autonomy principles — receives little respect. The lack of understanding of how R&D activity proceeds is another issue, preventing release of procurement decisions in a timely manner or causing disputes about the approach of the project team.

**Beneficiaries also report positive experiences based on interactions with staff with RDI funding expertise.** Beneficiaries consistently report that personnel of HAMAG-BICRO offer a good example of an agency versed in communicating with R&D clients, from both academia and the private sector. For a while, the former innovation agency (BICRO) has built up its capacity to support RDI project implementation. The staff’s direct dealing with beneficiaries and training have equipped them to serve as a fit and competent, yet impartial, interface with R&D applicants.

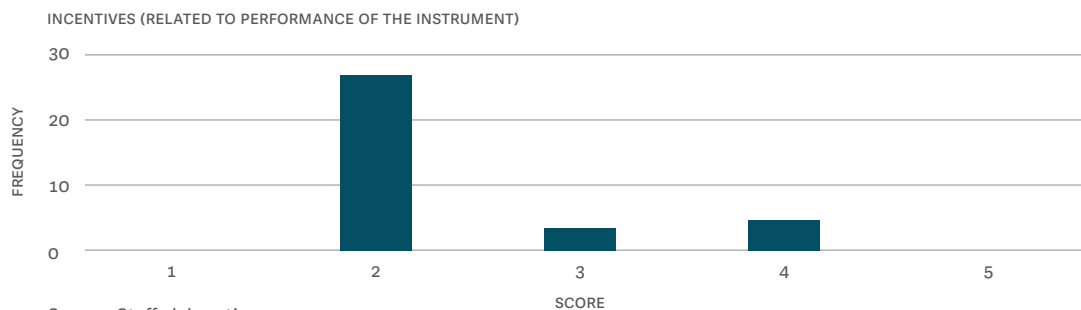
### Takeaways

- Trust is the foundation for building a relationship. Everyone is trying to help and contribute. Maintaining this attitude will help form partnerships.
- Presenting senior officials with a stronger alliance and joint proposals on how to improve ESIF management might look unorthodox but it could change the paradigm from ex post restriction to ex ante advice and from control to collaboration. The interaction of beneficiaries and project officers in intermediate bodies has already resulted in learning and improvements.

- Recruit or reassign highly qualified personnel for the design and management of innovation and research programs, because the work requires analytical capacity, flexibility, and autonomy to decide in rapidly changing conditions. Such qualified staff should have a clear career advancement path and reward system.
- Recognize and establish units or clusters within agencies where staff can exercise a high level of discretion, relying on professional judgment rather than merely assuming and executing a bureaucratic role and controlling for rule compliance.
- Give attention to HR management to encourage it to conceive new models that allow development and emergence of core groups able to go beyond compliance, expanding their knowledge to M&E concepts; design of operations; evaluation for learning; and operation manuals and documents that are client-oriented, not bureaucracy-centered and self-serving. Such teams will be able to evaluate project results in meaningful manner.

## 2.2.11 Incentives

**Figure 2.38** Most programs do not have incentives related to program performance



**While staff evaluations exist, no incentives (positive or negative) are tied to program performance.** Most programs score medium-low in this area (Figure 2.38). Best practices in modern organizations encourage specific connections between reward schemes for personnel and the performance of the instruments or programs for which they are responsible. In contrast to most programs, some implementing units of the PoC and UKF programs do have performance bonus frameworks for meeting planned targets, but these relate mainly to activities (e.g., number of reviewed projects), rather than program outcomes (e.g., increased enterprise innovativeness).

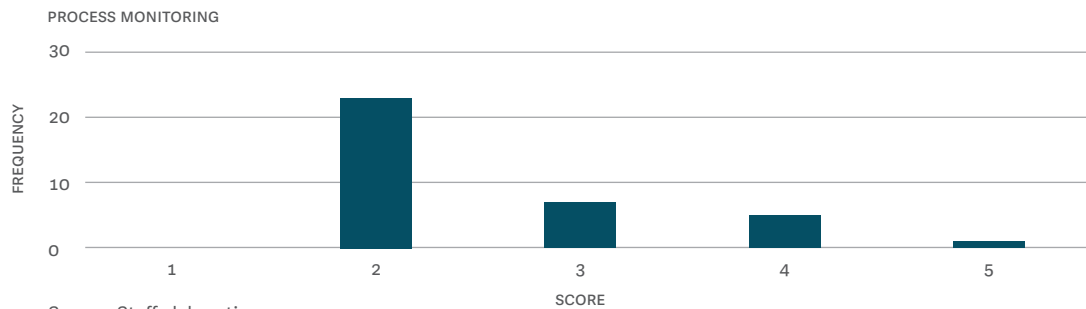
### BEST PRACTICE CHECKLIST — Incentives

- Clear and explicit criteria exist for assessing staff performance.
- Rewards and punishments are linked to the established criteria.
- Effective consequences follow poor performance, and excellent performance is rewarded.



## 2.2.12 Process monitoring

**Figure 2.39** Process monitoring is rare



Source: Staff elaboration.

**Process monitoring has significant gaps compared to best practices.** Process monitoring relates to the quality of the administration that implements the program/instrument under review. In most cases, process monitoring occurs sporadically, without systematic reporting, and it does not inform management decisions (Figure 2.39). Exceptions include Research Projects, and Installation Research Projects, PoC, and UKF. Research Projects and Installation Research Projects measure the time needed to complete a program cycle and its steps. In addition, each call is subject to what is termed a *super-evaluation*, which consists of feedback from researchers that did not apply to that call, with suggestions for improvement. PoC implements effectiveness statistics calculated after each call, including how much time it takes to process one application, how many people are needed to administer the process, and so on. In UKF, the process is less formal, but monitoring is continuous and used to make quick adjustments.

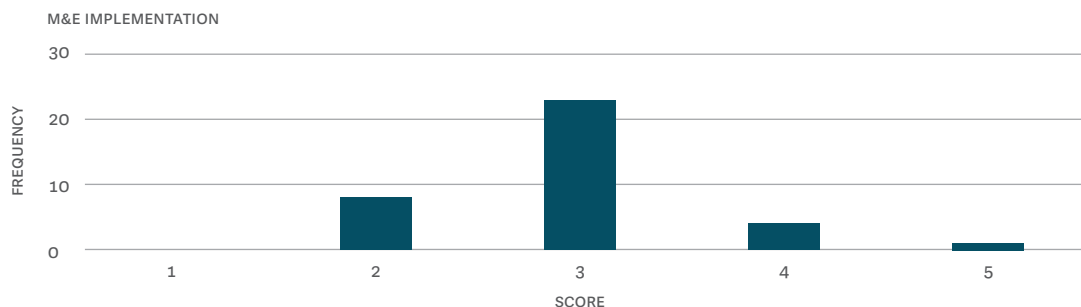


### BEST PRACTICE CHECKLIST — Process monitoring

- A monitoring system process with clear indicators is in place.
- The monitoring process is applied periodically to maintain management quality.
- Reports on management quality are submitted and presented to higher authorities.

## 2.2.13 M&E implementation

**Figure 2.40** M&E remains underutilized for informing program adaptations



Source: Staff elaboration.

**The monitoring and evaluation process is not utilized to its full potential.** Both external and internal evaluation are necessary for accountability and learning. The purpose of this category is to use evaluation results for improvements and in future design. Figure 2.40 presents the distribution of results in the M&E dimension. M&E follows from the scheme defined in the design process. No process is in place to anticipate impact evaluations, however. Rather, OPCC envisages performance assessments at the level of each OP priority axis. Such assessments have been conducted for Priority Axis 3: Business Competitiveness (ECORYS 2019). This assessment focuses on measuring the progress toward the targets set out in the OPCC but does not approach a full-blown impact evaluation. Assessments have been conducted under the SIIF program as well, but they focused on the results of individual projects, specifically on the achievement of project objectives, efficiency in terms project management and observed effects after project end. These did not constitute a full impact evaluation at program level. On the other hand, PoC conducted an internal evaluation based on a survey of beneficiaries. The program follows up with beneficiaries three to four years after project completion, and the feedback influences the mechanics of the next call.<sup>20</sup> In some cases, monitoring is fragmented, with a dual process of data collection and maintenance (both an integrated one at OPCC level and a local one). This usually occurs because the centralized monitoring system does not cover additional useful information on the outputs and outcomes of project implementation, as well as achievement of targets related to the Smart Specialization Strategy. Local data collection is typically done manually through a complex web of spreadsheets and shared folders, increasing the possibility of human error, introducing inefficiencies in the system, and making data updates more burdensome.

### BEST PRACTICE CHECKLIST — M&E implementation

- An M&E system works on a continuous basis.
- Information is collected for indicators at all levels (activities, products, etc.). Indicators are adapted and improved with time.
- The program has an impact assessment.
- Mechanisms are in place for learning and adapting the program.
- Programs have been revised based on implementation lessons.



<sup>20</sup> In addition to this, impact evaluation was conducted for the PoC program under STP2 using a survey of beneficiaries and a propensity score matching method.

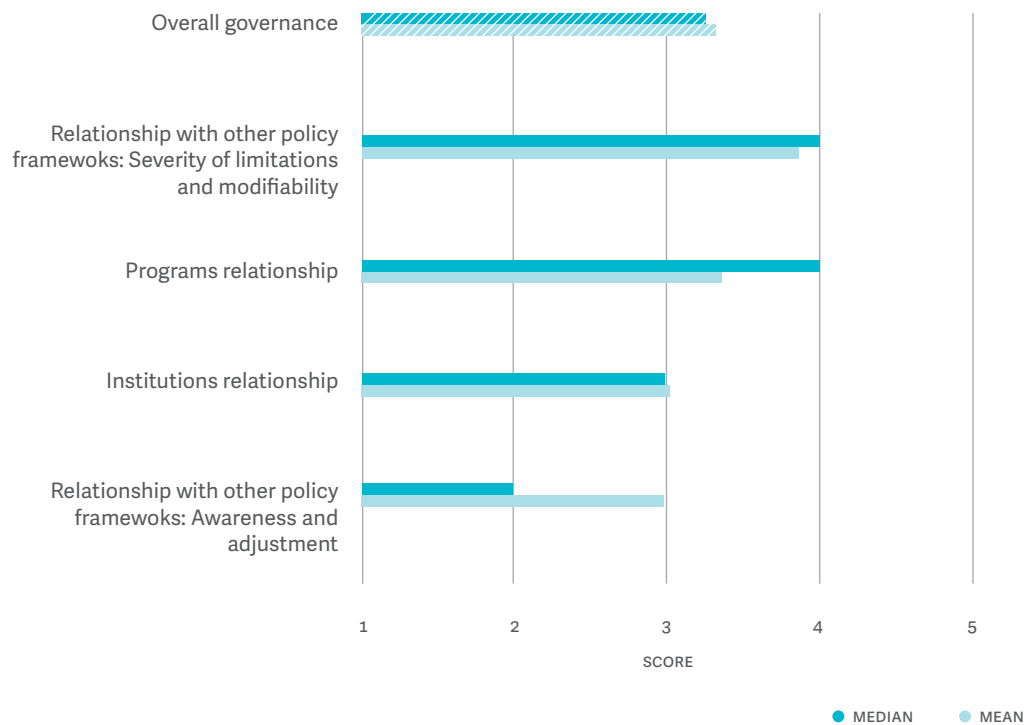




## 2.3 Governance

**Program governance is analyzed in four areas.** These include the relationship between programs in the same institution and relationships across institutions. Also addressed are interactions of jurisdiction rules and regulations, including both internal responses and the seriousness of external constraints imposed. The average and median scores in each category are presented in Figure 2.41.

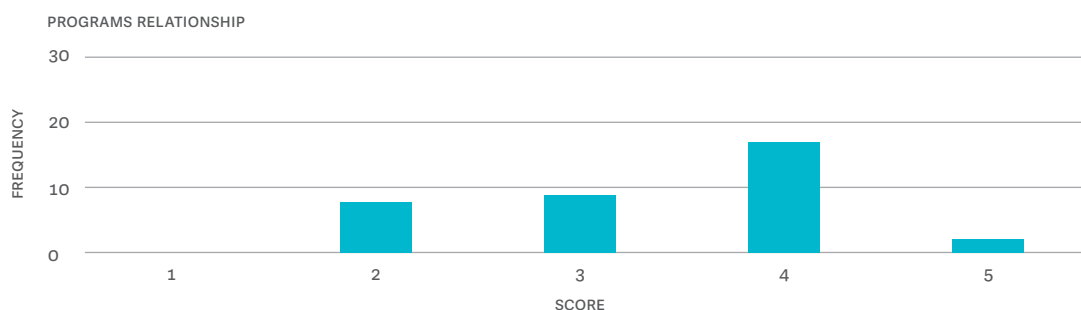
**Figure 2.41** Scores in program governance and its components



Source: Staff elaboration.

## 2.3.1 Relationship between programs

**Figure 2.42** The relationship among programs is largely acknowledged



Source: Staff elaboration.

**Most programs contain specific acknowledgement of other programs, but understanding of interactions is limited.** The programs' relationship scores reflect the extent to which institutions communicate sufficiently to avoid having multiple funding schemes in different agencies target the same population of beneficiaries for similar objectives. It also reflects awareness of complementarities and synergies between programs. The fragmentation of Croatia's national innovation system makes it difficult for policy makers to see the full picture. Most institutions are aware of potential overlaps and complementarities within their own portfolios. For example, MSE programs for R&D are coordinated internally, with consideration for competition and gaps among the grant schemes. Similarly, within MEEC, internal mechanisms coordinate instruments within their purview. Coordinating between different institutions is more challenging, however. In the design of one CEKOM model, for example, MEEC was not aware that a similar program for industry-science collaboration (STRIP) existed<sup>21</sup>. MEEC dropped the overlapping model after consultation with MSE.

### BEST PRACTICE CHECKLIST — Relationship between programs

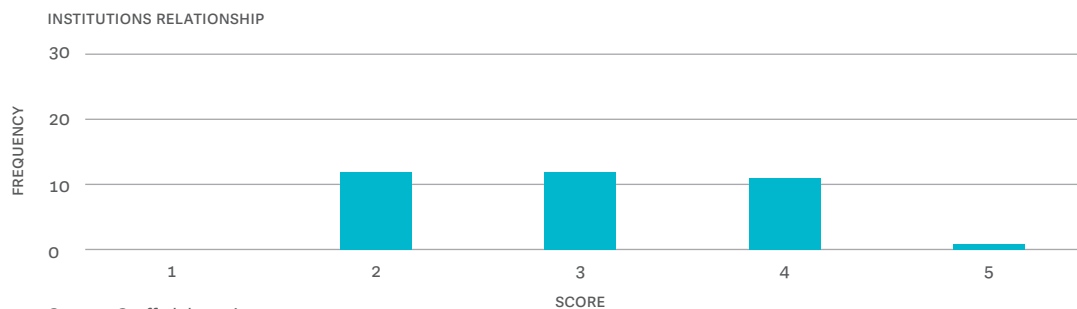
- The program does not compete with other public or private programs.
- Complementary programs communicate and are integrated.
- Explicit complementarity criteria exist for the overall effectiveness of related programs.



<sup>21</sup> The CEKOM program envisages several different collaboration models. Model 1a is for collaboration between an organization for research and knowledge dissemination (except for PROs) as main applicants, and at least two entrepreneurs as partners. Model 1b has at least two entrepreneurs as main applicants and a PRO as partner. In Model 2 the main applicant is an innovation cluster of at least three entrepreneurs and, if needed, one or more organizations for research and knowledge dissemination as partner. Model 3 is aimed at legal entities that manage research infrastructure.

## 2.3.2 Relationship between institutions

**Figure 2.43** Coordination between institutions is lacking



Source: Staff elaboration.

**Institutions' relationships vary widely between programs.** Practices in Croatia range from informal, sparse, and sporadic efforts at communication across institutional boundaries to partial coordination to formal coordination at the tactical level (Figure 2.43). Best practice requires awareness of interactions and measures to ensure cooperation if interaction is an inevitable part of the governance structure. This has been challenging in the context of the ESIF management structure. Each program requires MA, IB1, and IB2 involvement, and their interactions shape program design and affect implementation. Difficulties in these interactions were often cited by program managers as a process bottleneck. In addition to the ESIF management structure, one of the more important relationships is that between MSE and MEEC. Given that the interaction of academia and industry is a desirable system feature of innovation processes, a high level of coordination between the two institutions is desirable. While a formal coordination platform exists in the form of the Inter-ministerial Working Group of the National Innovation Council, its use should be intensified to discuss program preparation, establishing a feedback mechanism for consultations, both at the strategic and operative level. Coordination with the private sector is also important. The MEEC used the clusters of competitiveness platform to coordinate with the private sector; however, in the current medium-term financial framework funding for clusters is limited, and some of them stopped operating. The successor to the IRI program, launched in February 2020 (IRI 2), used thematic innovation councils as platforms for consultation.

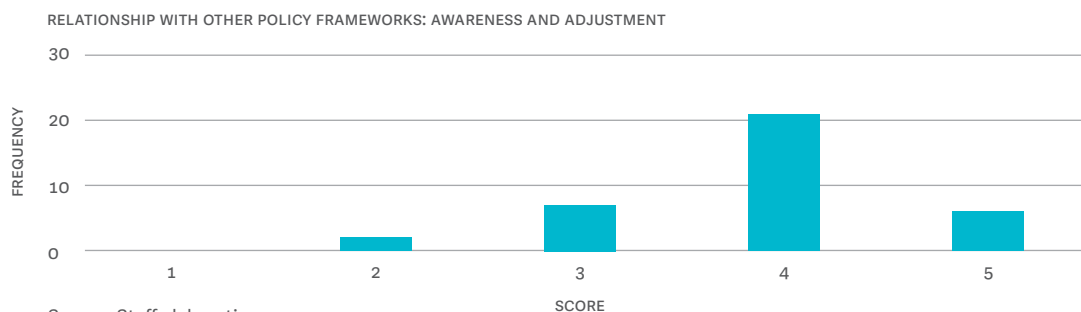


### **BEST PRACTICE CHECKLIST — Relationships between institutions**

- Coordination and participative mechanisms with other public and private institutions are in place.
- Evidence shows that work and joint design processes take place with other institutions.

## 2.3.3 Relationship with other policy frameworks: Awareness and adjustment

**Figure 2.44** Jurisdictional interactions are acknowledged with limited reaction



**Most programs are aware of jurisdictional interactions.** Jurisdictional interactions occur when the regulatory or legal framework has consequences for an instrument's operation. Most programs formally acknowledge the laws and regulations that influence programs. Staffs are well aware of the implications, as indicated in Figure 2.44. Calls for proposals for ESIF-funded programs provide an exhaustive list of relevant legal acts and regulations. Another aspect assessed in this category is internal capacity of the program management to adapt or leverage the context to optimize operation. The STEM Scholarship program has excelled in this regard. The scholarships were included as part of family income, which impacts social support thresholds. This issue was documented and used as a basis for successfully lifting barriers that diminished program effectiveness. The Croatian Venture Capital Initiative also faced uncertainty over taxation and burdensome governance regulation of venture capital funds in Croatia. Later changes allowed for establishing the venture capital fund in Luxembourg, circumventing tax and governance concerns.

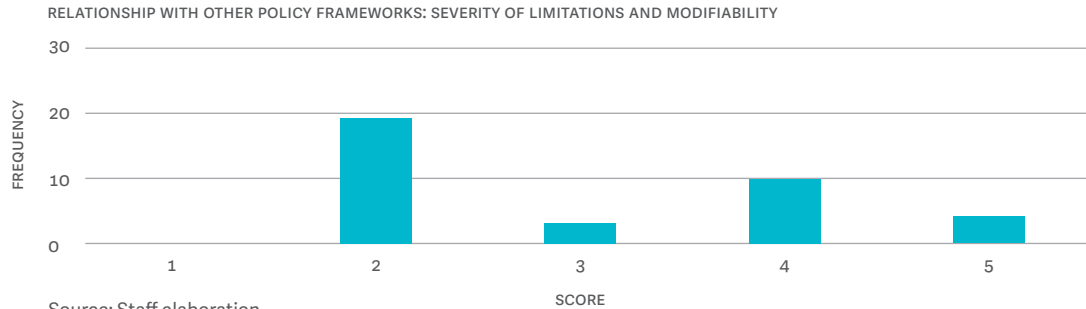
### **BEST PRACTICE CHECKLIST — Relationship with other policy frameworks: Awareness and adjustment**

- Programs are knowledgeable concerning laws and regulatory constraints.
- The organization takes action to leverage positive or mitigate negative factors.
- The program adapts to these limitations.



## 2.3.4 Relationship with other policy frameworks: Severity of limitations and modifiability

**Figure 2.45** In many cases, external regulations seriously inhibit program effectiveness



**In many cases, regulations inhibit instrument effectiveness and are difficult to change.** External regulation and constraints can significantly hamper the program impact and are very difficult to overcome. In the research sector, these constraints relate to systemic issues such as high institutional fragmentation and inadequate incentives for researchers to pursue excellence, collaborate with the private sector, or transfer or innovate its technology. This adversely affects not only programs targeting researchers but also programs designed to foster industry-science collaboration. For example, one issue with the Innovation Vouchers programs is that the public research sector does not have the proper incentives to work with the private sector. Issues such as complex state aid regulations and public procurement rules place a significant burden on beneficiaries and applicants (see “Stories from beneficiaries: *Procurement rules in R&D projects*), and they are almost impossible to change with purely administrative measures.



### **BEST PRACTICE CHECKLIST — Relationship with other policy frameworks: Severity of limitations and modifiability**

- If the policy goals are politically significant, it is necessary to raise awareness of the constraints by involving relevant stakeholders.

## Stories from beneficiaries

### Procurement rules in R&D projects



“ The impression is that the research makes one-tenth of the entire project, with the remainder of efforts spent on administration... ”

“ ESIF program management is overly bureaucratic, rigid and regulated. It is transaction-oriented, task-oriented rather than results-oriented. ”

**Specifics of R&D activities are not recognized in public procurement rules.** When it comes to implementation of full-fledged R&D projects, the two concepts clash. This problem arises because programs funded from ESIF are subject to public procurement rules. Since the Croatian Public Procurement Law (PPL) fully aligns with Directive 2014/24/EU on procurement, which contains no exemptions for R&D, no amendments to the PPL can be made.

**One of the main concerns for beneficiaries, particularly in ESIF-funded R&D projects, relates to burdensome procurement procedures.** Anecdotal evidence provided by some beneficiaries suggests issues related to the information system used, communication with institutions, eligibility of costs, and procurement of consumables. According to the accounts of some beneficiaries, the information system used for reimbursement of costs is inefficient and burdensome: in addition to filling out forms, beneficiaries have to file additional documentation for requests to be processed. Sometimes during project implementation beneficiaries must submit the same documents multiple times for each request for reimbursement relating to tenders the documents for which have already been submitted. Some beneficiaries reported ad hoc requests, made at the discretion of project officers, for additional supporting documents; such requests are typically communicated informally.

**Efforts to simplify cost reimbursements resulted in additional documentary requirements.** The so-called simplified cost option (SCO) aimed to simplify budget preparation for project proposals. However, according to some beneficiaries, it resulted in the need to collect and provide additional documents already available to public institutions and administrative documents referred to as “evidence for calculation of salary according to SCO method.” The EC has already introduced the second stage of financing simplification for scientific projects, including for Horizon 2020 (i.e., a lump sum model).

**Planning for procurement items is required well in advance, which is often not possible in R&D projects.** Unpredictability of the course of research prevents beneficiaries from advance planning for specific items and quantities in detail. The need for chemicals and laboratory consumables depends on the results achieved under specific stages of research, the optimization methods, and validation and exploration during research activities. Planning for procurement is not a requirement according to the EU Procurement Directive, nor it is a requirement of the Croatian PPL. Rather, it has been required under the general terms applied to ESIF-funded projects. These terms authorize institutions in the system of management and control to request many supporting documents or to apply requirements not stipulated in the PPL.

**The review of expenditures for R&D projects requires specialized knowledge and can take considerable time to complete.** R&D projects often require procurement of machinery or consumables with very specific configurations. Reviewing these expenses requires specialized knowledge, and beneficiaries are often required to provide additional explanations. Sometimes beneficiaries are asked to combine procurements into one tender for goods or services they deem incompatible. Extended delays in reviewing documentation compound the risk of market price increases, which puts projects in financial jeopardy. Sometimes, prolonged reviews of executed procurement can even negatively affect the liquidity of the beneficiary institution.

**Not all EU-funded programs encounter these issues.** For example, the Horizon 2020 program takes into account the specificity of R&D activities and the unpredictability of R&D material. The program also requires less frequent reporting (semiannual instead of quarterly).

### Takeaways

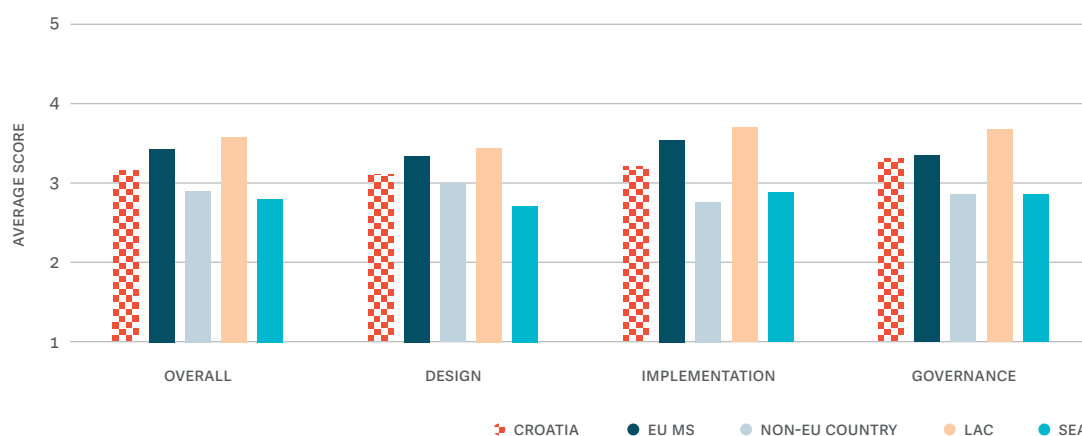
- Training beneficiaries in procurement is much needed. Beneficiaries should upgrade their skills for preparing procurement documentation compliant to PPL. This issue sometimes shows in procurement lists that are overly itemized rather than grouped under a broader equipment cluster.
- Implementation support to beneficiaries should be strengthened. A group of experts knowledgeable in R&D and procurement could be mobilized to provide technical and implementation support to beneficiaries and to help them plan and arrange procurement.
- Specific procurement guidelines could be made to assist beneficiaries. According to previous experience, specifically prepared guidelines would be useful to beneficiaries by helping them become familiar with new procurement rules and principles.

## 2.4 Cross-country comparison

**Functional and governance analysis has been carried out in several countries in the world which allows for cross-country comparison.** The same methodology was used in all countries to assign scores to STI support programs. For the purposes of the comparative analysis, aside from Croatia, we are including another EU member state, a non-EU European country, two countries from the Latin America and Caribbean region (LAC) and three countries from South-East Asia (SEA). The names of regions used in chart are not representative of that whole region and should be interpreted as averages for a limited set of countries.

**Croatia performs better than non-EU and SEA countries, but trails behind the EU member state and two LAC countries.** Figure 2.46 presents the aggregate results of the functional and governance analysis for Croatia and seven countries grouped into four regions. Overall, Croatia performs better than the analyzed non-EU country and three SEA countries. This is not surprising, considering the non-EU country is an upper-middle income country and the three SEA countries are all lower-middle income economies. At the same time, Croatia has lower scores than its EU peer as well as two LAC countries, one of which is a high-income economy. The widest discrepancy between the analyzed countries is observed in the implementation category, where Croatia on average scores 0.4 points higher than the lowest-scoring country, but could stand to learn from its EU peer and high-income LAC countries.

**Figure 2.46** Croatia has better scores than non-EU and SEA countries but lags behind EU and LAC countries

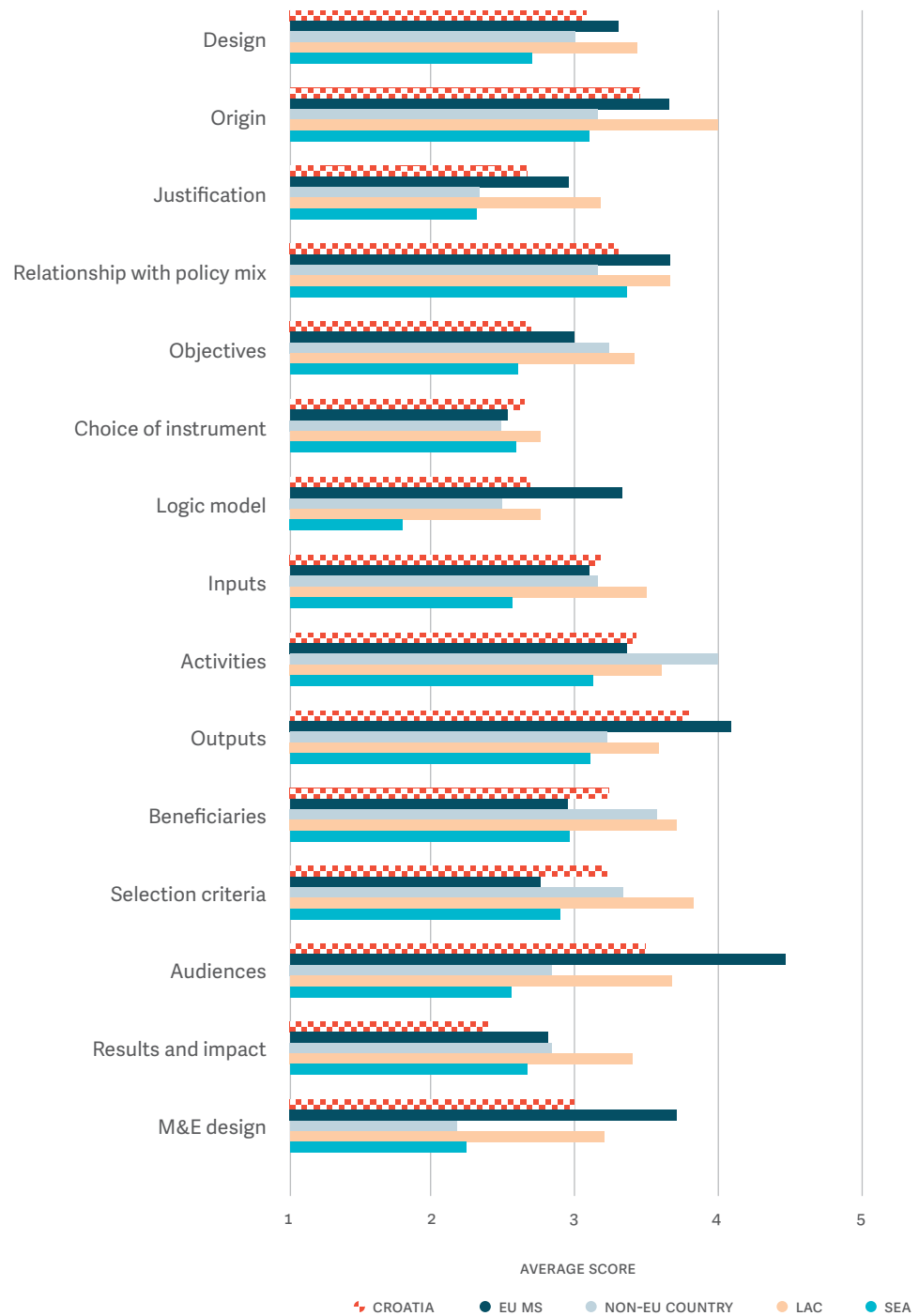


Source: Staff elaboration.

**In terms of design, most countries struggle with choice of instrument, justifications, use of logic models, and identifying impacts.** Figure 2.47 illustrates the breakdown of the design score by category. For choice of instrument, no country group achieved an average score above 3. Only one country group had an average score above three in justification and use of logic models. Croatia ranks third in most areas, but scores comparatively better in identification of inputs and outputs. The category Objectives is an area that requires significant improvement, and same goes for the category Results and impact where Croatia ranks the lowest among all country groups.



**Figure 2.47** Design score breakdown by country group

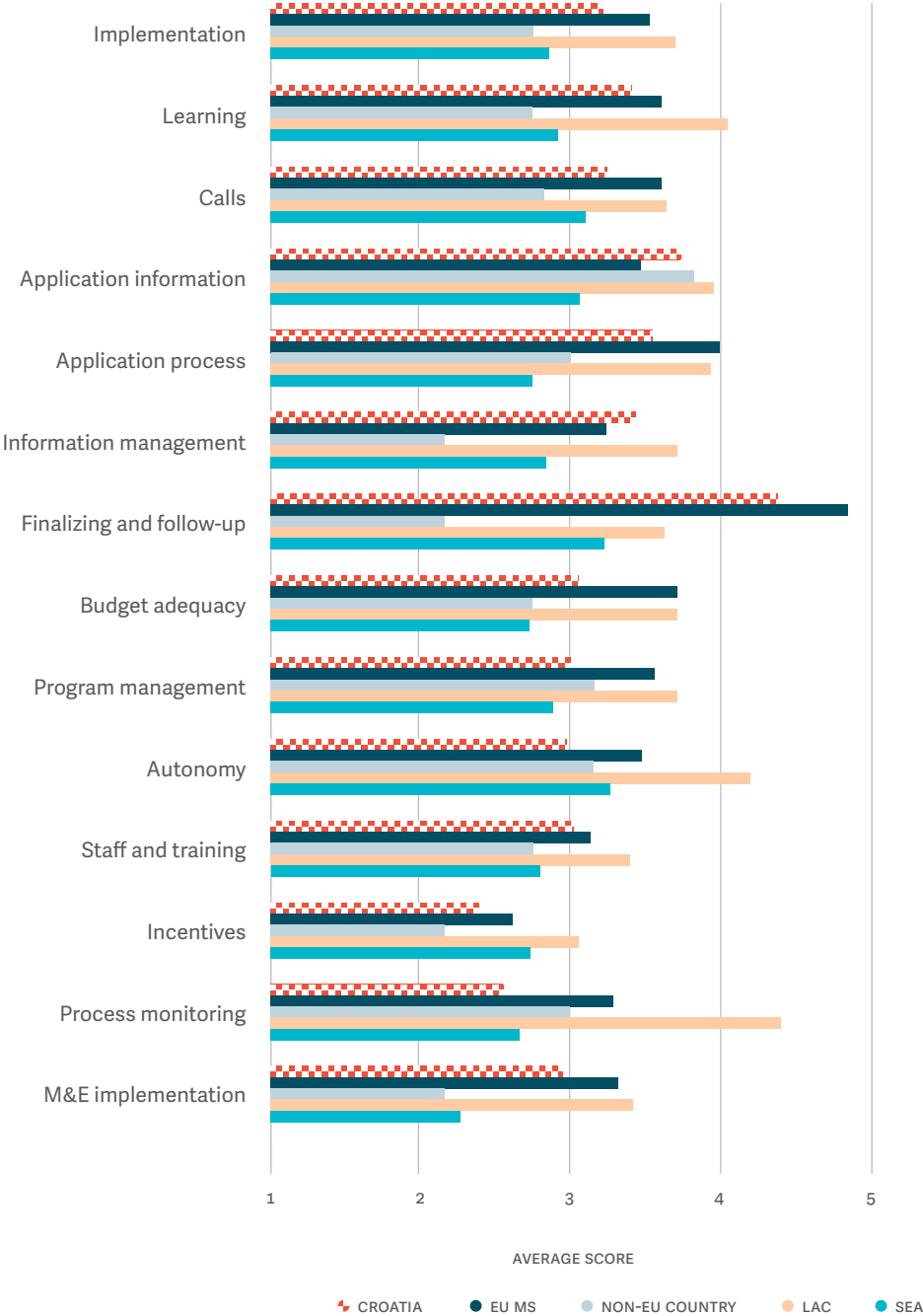


Source: Staff elaboration.

**On the implementation side, most of the analyzed countries face challenges related to staffing and incentives.** Figure 2.48 presents average scores for each area of implementation. The lowest scores in all country groups are concentrated in areas related to human resource management, specifically performance incentives to staff and staff adequacy

and training. Croatia, like its EU peer, has better closure practices than other countries and also performs comparatively better in information management. Areas where Croatia scores the lowest compared to other countries are related to staff autonomy and process monitoring. Incidentally, there are areas where LAC countries score the highest in terms of implementation.

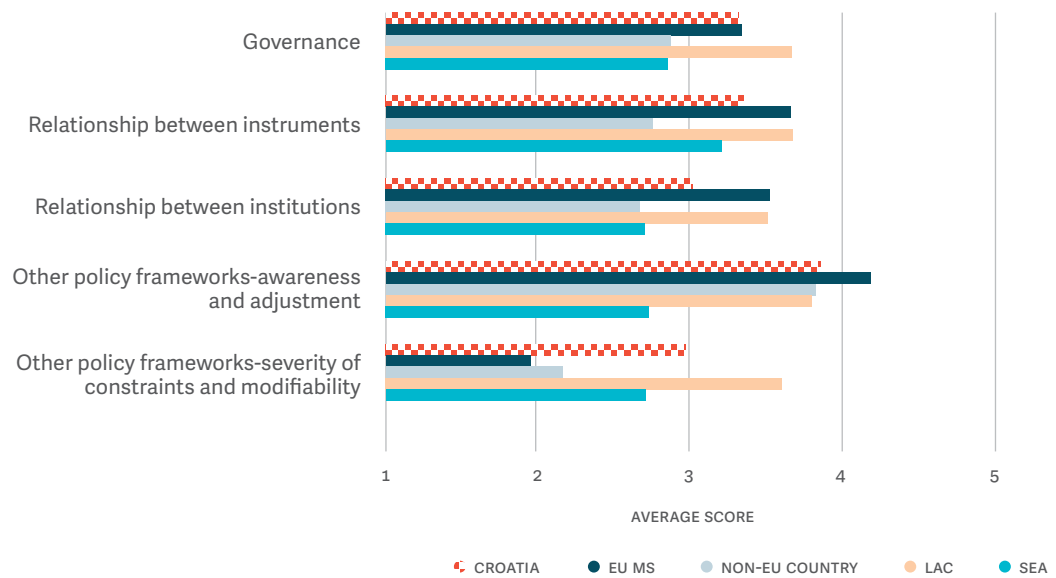
**Figure 2.48** Implementation score breakdown by country group



Source: Staff elaboration.

**Croatia scores similarly to its EU peer in terms of overall governance, but they have some important differences within individual areas.** Figure 2.49 shows average scores for each area of governance and each country group. The similar overall governance scores of Croatia and its EU peer may not come fully as a surprise, since EU countries operate in a certain governance context which is very specific and unique to the EU (see further details in section 5). Scores for relationships between instruments and institutions are highest in Croatia's EU peer and the two LAC countries. Awareness and adjustments to external policy interactions in Croatia are roughly at the level of non-EU and LAC countries, and slightly lower than in its EU peer. Croatia scores a whole point higher than its EU peer in terms of the severity of external constraints and their modifiability.

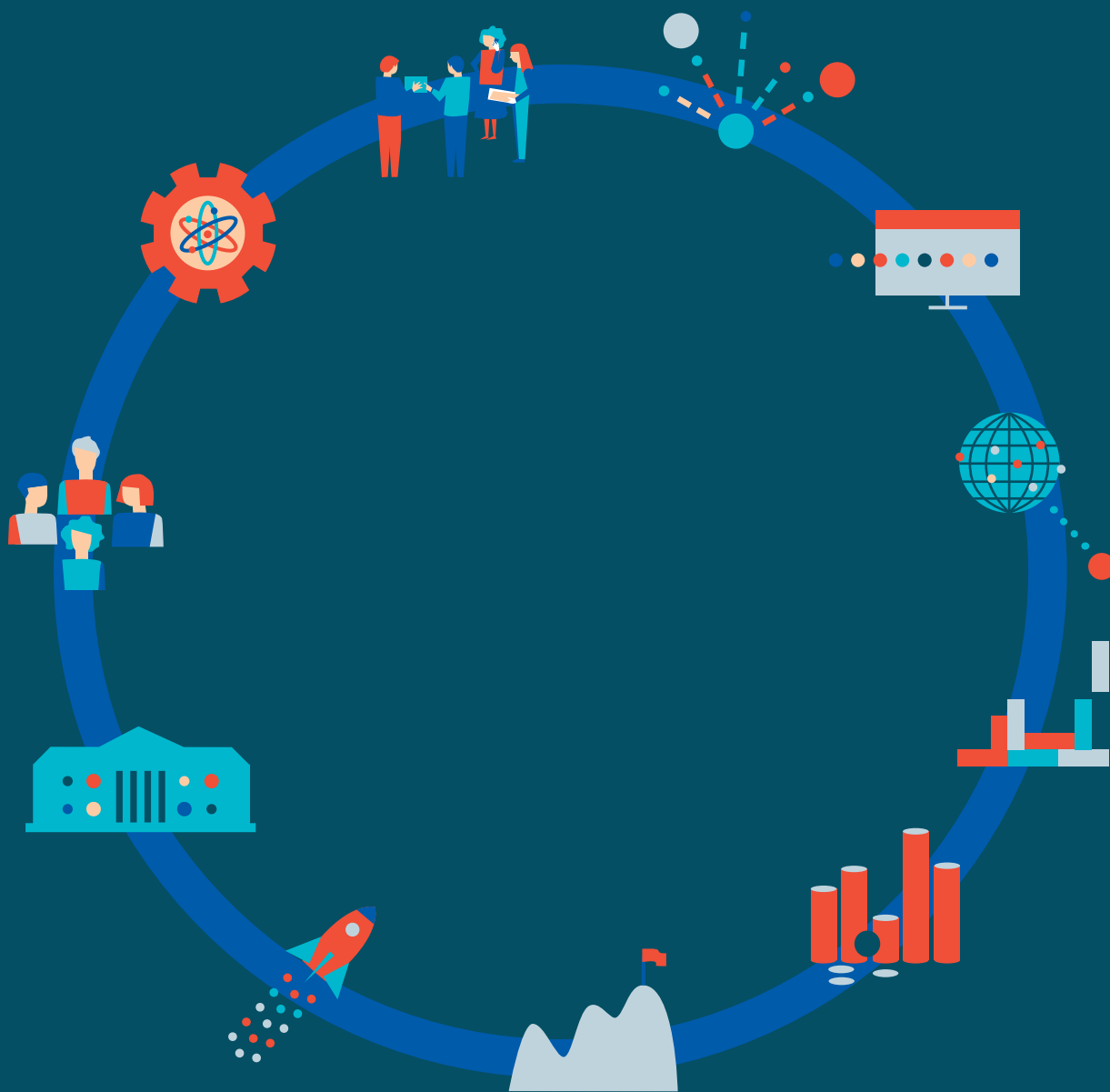
**Figure 2.49** Governance score breakdown by country group



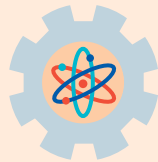
Source: Staff elaboration.

# 3

# Crosscutting Issues

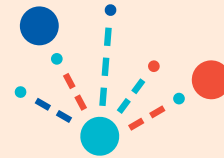


# Crosscutting Issues



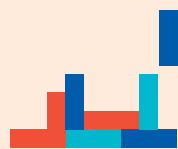
## Structuring support for commercializing research

Some attempts at supporting industry-science collaboration put public research organizations (PROs) in a leading role, despite their disadvantages in incentives and market knowledge. Developing and maintaining linkages between PROs and industry requires investing in specialized organizations or offices that bridge academia and the market.



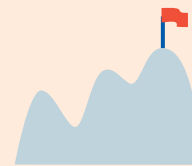
## Developing justifications for public interventions

Programs' designs often rely on unverified assumptions, which leads to suboptimal selection of the type and scale of policy intervention. Well-developed logic models and clearly identified market and system failures can help to correctly identify the problem and establish a clear connection to the proposed intervention.



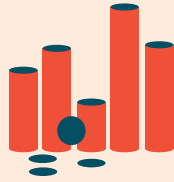
## Using logic models as a best practice in policy design

A higher level of awareness is needed regarding the usefulness of an explicit theory of change, including administrative incentives to develop and use such theories. Logic models can be created both for new programs and for those already being implemented.



## Setting program objectives

Objectives should be defined in such a way that they reduce ambiguity and conflict. Even if the desired change in the economy is general and broad, each individual intervention should show how it will contribute to a system-level goal.



### **Making funding more stable and predictable**

Lack of funding predictability makes it difficult to achieve desired policy objectives. Institutions should focus on removing obstacles to timely implementation and improved calls.



### **Assembling high-quality review panels**

Challenges in reviewer recruitment should be addressed by developing and maintaining a network of reviewers and finding a way to adequately remunerate experts serving on review panels.



### **Setting effective selection criteria**

Selection criteria should be adapted to improve project targeting.



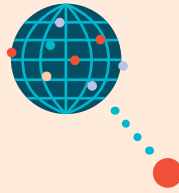
### **Improving human resource management**

Government agencies must recognize the particularities of human resource management in innovation policy. Compensation and training policies should reflect the specific expertise required to manage innovation support programs.



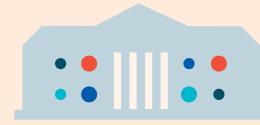
### **Developing M&E systems and capabilities**

Government capabilities for executing and using impact evaluations must be strengthened. Policy makers would thus have the rigorous evidence needed to improve programs and adapt them to changing conditions.



### Optimizing reporting and auditing

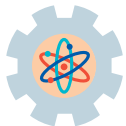
Monitoring and auditing beneficiaries should evolve toward a risk-based system, focusing on results (outputs and outcomes). Currently, rigorous European audit procedures impose onerous obligations for expenditure control. A more flexible project monitoring approach would require upgraded institutional competence specifically geared toward managing innovation support programs.



### Enhancing interinstitutional coordination

To overcome coordination challenges, institutional capacities should be strengthened, and interinstitutional cooperation further formalized.

**This section provides a deeper look into common issues identified across multiple programs.** For each issue, we explain its significance in a broad context, improvements being made in Croatia, reasons behind the problem, and global best practices.



## 3.1 Structuring support for commercializing research

### Why is this important?

**Commercializing research provides new products and services that meet market demand and advances the economy technologically, but market failures and market dynamics can interfere.** For instance, the high uncertainty of commercialization activities can generate significant information asymmetries that result in inadequate financing or the inability to develop innovative projects (Arrow 1962). Other market features, such as competition, market demographics and trends, regulatory challenges, access to capital, risk (in)tolerance, may hinder commercialization efforts. On the supply side, researchers with commercially viable ideas may be prevented from engaging in commercialization activities because their knowledge of the legalities for protecting intellectual property is limited or they lack business expertise such as finance, market and competitive analysis, business strategy, etc. From the demand perspective, firms may have limited capabilities to assess the business viability of their research, a necessary step for entrepreneurs making investment decisions.

**These market failures lie behind governments' reasons for intervening.** Financing organizations that match researchers with entrepreneurs can help improve firms' productivity and enhance the development of applied research carried out at universities and public research organizations (PROs). The lack of commercially viable research by PROs is often caused by weak mechanisms for collaboration, customer discovery and creative problem solving between research institutions and industry. Technology transfer offices (TTOs) in most developed innovation ecosystems typically provide services such as guiding technology licensing, managing intellectual property and spin-off companies, and developing relations between academia and industry. Failure to commercialize research may also reflect lack of knowledge and experience within the private sector about successful approaches to commercializing new technologies available from PROs (Arrow 1962). TTOs can create mechanisms to support, accelerate, and even "curate" interaction and information sharing between PROs and industry, SMEs, and startups.

**Collaboration for commercializing innovations should, in principle, be guided by private sector needs.** Research institutions are not necessarily the only sources of knowledge for innovation, and they should regularly engage with a network of current and prospective industry partners, investors, and entrepreneurs to promote tech transfer transactions, industry-sponsored research agreements, startup support, etc. Lack of knowledge flow within value chains in the private sector is a much more serious problem (Cohen, Nelson, and Walsh 2002). Contrary to the common belief that academic research generates new ideas for commercial R&D projects, most innovations are driven by the challenges and needs of industry, while public research both suggests new R&D projects and supports completion of ongoing engagements in roughly equal proportions. The literature also provides evidence that the key channels through which university research impacts industrial R&D are papers and reports, scientific conferences and meetings, informal information exchange, and consulting. Direct cooperation with firms can help to ensure that training programs and practices focus on priority areas – and can lead to other types of productive academic/industry interactions as well (licensing, sponsored research, etc.).

### **What is not working well in Croatia?**

**Support for linking public research with the private sector is generally weak in Croatia.** Some attempts at creating these linkages are currently underway, with PROs taking a lead role. These PROs are not specialized institutions with in-depth competences in the field of technology transfer, and therefore predominantly supporting university-industry projects using PROs as the main grantee is not the most efficient way of advancing contacts between scientists and private companies. The PROs do not have clear incentives, nor do they have the necessary capabilities (including market knowledge) to be successful at developing commercial products. The PROs' interest in engaging in commercialization activities may be motivated by internal demand from their own academic interests. Their arguments are often based on a principle of "applicability" of their R&D projects. Their understanding of the needs of the market is uncertain, however, and these activities may not succeed in reaching true commercialization.

**Using PROs as principals for technology transfer jeopardizes the success of commercialization activities.** Risks are still present even when PROs find private sector partners. Firms often partner with PROs, especially if the costs are low, to gain access to lab



equipment and exposure to new ideas, to enlist the PRO in helping to solve problems related to the firms' own developments, and to meet promising future graduates. While these are legitimate reasons for collaboration, they are not actual commercialization activities. Furthermore, they may degenerate into free-riding arrangements that, among other distortions in the collaboration, provide firms with free space in the PRO facility and cheap labor from faculty or students who feel obligated to meet the firms' expectations. Mitigating this risk requires investment and training in good practices for TTOs – leading to partnerships with measurable benefits.

### Areas for improvement

**A better understanding is needed of the differences in institutional features between the academic context and commercial market environment.** This phenomenon has been identified in the literature as the “heterophily” between university and industry (Rogers 2002). Even when engaged in shared projects and activities, academic institutions and firms have different goals, different time frames, different patterns of knowledge sharing and communication, different incentives, and different senses of what is interesting and important. This is why collaboration based on “design thinking” is needed – to identify industry challenges and needs, and leverage areas of expertise of each side for their mutual benefit.

**The institutional context and organization of Croatia's PROs is not conducive to commercialization.** Croatian PROs do not have sufficient experience with or a history of commercialization. Researchers do not have incentives to engage in commercialization activities. No clear link exists between commercialization and researchers' career advancement (World Bank 2019), and no clear national policy addresses technology transfer.

### What are global best practices? DOs and DON'Ts

**To develop and maintain a fruitful network of linkages for PROs with industry, specialized organizations or offices should be set up to bridge the contextual divide between academia and the market.** The literature shows broad consensus on this matter. These specialized organizations, termed “boundary organizations,” are necessary for fruitfully advancing commercialization activities (Markman, Siegel, and Wright 2008). Technology transfer offices, on one hand, are often part of the larger support environment for technology transfer from universities and PROs; on the other, they help entrepreneurs address knowledge gaps. In addition, science and technology parks often support development of technology-intensive sectors with commercialization of research and technology transfer (Cirera et al. 2020). In any case, the problem is multidimensional and requires more than a simplistic solution.

**In the most successful innovation ecosystems, companies look to the universities for partners, not the other way around.** When companies act as the principal in the technology transfer process, chances of success increase because they have the best capabilities for assessing the market potential of research activities. The role of boundary organizations is to effectively connect PROs to the economy, and stimulate them to engage and actively seek to connect their knowledge assets with private sector needs and commercialization opportunities.

**Clusters and networks can help fill information gaps, particularly when they connect companies to expert sources of advice on commercialization.** Support in areas such as protecting intellectual property, developing a product or putting one on the market, and conducting commercial fundraising can be provided through specialized services provided by technology extension or development centers. From the demand side, public procurement can articulate the public sector’s unmet needs and provide a “pull” force to drive the commercialization or government adoption of innovative solutions.

**In general, where true commercialization potential exists, with clear profit in sight, the public sector involvement should be highly selective.** Such situations do not involve market or system failure that the government must repair. Examples of commercialization activities financed from private resources, which are more relevant in the late phases of the innovation cycle, include loans and loan guarantees and other financial instruments for innovation employed during commercialization, such as private equity and venture financing, factoring, intellectual property-based asset finance, and initial public offerings (IPOs) (Bravo-Biosca, Cusolito, and Hill 2012). These government actions are not directly involved with commercialization of the technology content, however. Rather, they address coordination and bottleneck issues in the financial sector that are not properly attuned to innovation investment opportunities. The firms still lead their own commercialization strategies.

**Table 3.1** Success factors in research commercialization

✓ **DOs**

- Support commercialization activities through specialized institutions such as technology transfer offices (TTOs), technology centers, and technology extension services (TES).
- Set-up a certification system for institutions supporting commercialization.
- Choose the right institution type for the right tasks (Cirera et al. 2020).
- Provide incentives for knowledge organizations — universities, research centers — to support research commercialization.
- Hire competent technical staff who can understand both science and commercialization (Albahari et al. 2017).

✗ **DON'Ts**

- Don't advance commercialization by assigning a specific commercialization objective to a general business support institution (BSO), such as an incubator.
- Don't provide public financing to initiatives arising from universities or local authorities without a strong assessment and a clear business plan (to avoid constant or full subsidization of parks, for example) (National Research Council 2009).

Source: Staff elaboration.

PROs may be encouraged to develop so-called “dual use” technologies, that is, technologies that both serve a strategic mission of the government and have potential for commercialization. Dual use technologies are rarely developed by the PROs themselves. Much space and defense technology is developed with a “dual use” justification. In these cases, however, the PROs tend to engage the firms as contractors and suppliers, with very strict specifications for the mission component. The firms are then allowed to develop commercial products from the results of their project with the PRO. All of this is generally framed within procurement arrangements rather than R&D projects.



## 3.2 Developing justifications for public interventions

### Why is this important?

**Design quality is the most important factor driving the effectiveness of a support instrument** (Howlett 2017). The central point of this process is to develop a fully grounded justification for government intervention that addresses the stated need. This component of the policy design process should be distinguished from the instrument’s origin, which precedes justification development and concerns the general identification of the problem and a transparent and legitimate process to initiate its consideration.

**A high-quality justification will contain a documented analysis of the gap that government intervention must fill, which is often a “market failure.”** A market failure is a situation in which the allocation of goods, services, and capital by a free market is inefficient and leads to a social welfare loss. In the case of innovation, limited appropriability, underdevelopment of financial markets, and external benefits to knowledge production suggest that the market system is likely to produce underinvestment in innovation relative to the socially desirable level (Martin and Scott 2000). Sometimes, the market failure may stem from the fact that the market does not yet even know that it needs a certain innovation. Where markets and other civic social institutions exist, the government must avoid competing or interfering with their activities and the benefits that the private sector produces organically in the economy and society at large. Public intervention in areas with no market failure would crowd out private investments by providing disincentives for firms to maintain activity in this area.

**The justification could also center on a “system failure” describing a necessary social good that is not forthcoming without government action or without a change in its current form of action** (Edquist 2011). An example of a system failure is the lack of high-speed broadband infrastructure, which prevents development of research in computer sciences (Woolthuis, Lankhuizen, and Gilsing 2005). A high-quality justification would also consider the specific capabilities that the government must have to address the gap and take advantage of the potential strengths in both the private and public sectors. The gap and its causes must be identified and a sensible measure of its size or intensity must be provided to give a sense of the scale of the needed intervention.

**Policy instruments do not have effects in isolation from other policies and factors in the context.** The policies in a domain, or policy mix, are interdependent. This is sometimes deliberate, but it does not always occur as intended. Thus, another major component of a successful design is an explicit consideration of an instrument's fit in the portfolio of currently implemented programs and strategies. The principles of coherence and rationality call for attention to potential interactions, both those that mutually reinforce and those that undermine the effects of the interventions in question. Mutually reinforcing policies may have objectives related to the outcomes of another policy; they could also be designed as follow-ups to improvements achieved by other initiatives. Explicit analysis of these possibilities is necessary to effectively fit a policy design into the wider policy domain; the analysis must either identify policies for which the one being analyzed is a good complement for the context or refine the instrument to focus on features or outcomes that do not undermine it.

**Incorrectly coordinated public policies may undermine each other.** An example of a policy mix challenge is the case of scholarships to graduate students in Croatia's priority areas of science and technology to pursue degrees at reputable institutions abroad. The policy may work well in producing many graduates, but policy makers may be surprised when the graduates do not find jobs on their return. In some countries, policies to address this situation have been set up that subsidize local companies (especially small and medium enterprises) to hire graduates in engineering and science. For a short time, while the subsidies exist, the companies take advantage of cheap high-skilled labor. The graduates end up working in jobs below their qualifications, however, and the companies do not retain them for long. It is therefore crucial for such initiatives to correctly identify emerging clusters of industry in the local context, the growth of which could be supported through investment in human capital.

### **What is not working well in this matter in Croatia?**

**Designs for innovation policy instruments are often not grounded in a reliable diagnosis of what doesn't work properly and what mechanisms could correct the failure.** Often, the justification provided is simplistic and based on unproven assumptions. For example, grant schemes for small companies to engage in innovation projects assume that money is the most critical factor stopping them from doing so. It is likely, however, that most small companies lack important innovation capabilities that money alone will not solve (Wellalage and Fernandez 2019). Moreover, even if money is the answer to getting SMEs to innovate, how much money, provided to how many companies, would make a difference in the economy of a region or nation? This question is rarely pondered.

**Understanding concerning the selection process for the type and scale of policy intervention is underdeveloped.** Suboptimal decisions on the type and scale of programs needed are the result of failing to develop explicit, measurable goals for the instruments. Two other shortcomings can be noted. First, no alternative modality for reaching the objectives is considered. A menu of options for instrument selection exists in the literature and should be considered when designing interventions to achieve innovation objectives for the economy. Available options relate to intervention mechanism (e.g., grants, vouchers, technical assistance, or financial instruments), target groups (e.g., young vs. older companies or companies with varying degrees of technical sophistication), and other

characteristics of intervention. The selection should be grounded in a detailed analysis of the problem the intervention must address and of the trade-offs between various alternatives. The second key design aspect that is almost always absent from the observed practice is an insufficient quality of diagnosis. In many cases, the justification focuses on symptoms (e.g., Croatian firms lag EU peers in productivity), rather than on the reasons behind these symptoms (which require a deeper analytical dive to discover).

**A detailed diagnosis of tradeoffs between alternative instruments is rarely conducted.**

The most common practice relies on economywide studies that detect deficiencies in broad categories. For example, this sort of diagnosis will detect that the number of innovating firms or the level of private investment in R&D is below that of other reference countries. The solution then offered is to provide government funding for companies to do these things. The question that should be answered in the first place, however, is “Why are companies not innovating?” In sum, the process of articulating the problem that government intervention must address and then finding an appropriate solution that addresses that problem is largely absent from observed design practices.

Some observations on how public support programs are affected by the above issue:

- Justifications of Croatian support programs rarely refer to market or system failures. Several programs show no formal diagnostic process, and the justification for intervention is implicitly assumed.
- The justification for intervention is especially neglected in the case of transnational programs cofinanced from ESIF, for which limited effort has been made to analyze the interventions’ fit with the needs of the Croatian economy and the existing policy mix.
- CEKOM provides an example of a program with a well-developed justification. It is based on specific outcomes of analytical projects conducted by the OECD, and it includes best practices in program justification in its underlying diagnoses for research projects (Installation and Research Support). In both cases, a dedicated diagnostic was carried out and the conclusions drawn from it influenced the design of interventions.

### **Areas for improvement**

**A common starting point for policy makers when choosing a policy instrument is to replicate what “successful” countries have implemented.** Often in the European Union, member states copy one another’s interventions. As a result, many programs run by institutions from different countries are based on very similar assumptions. This approach is also widely used by managers of Croatian STI support programs, which is understandable considering the relatively young age of the innovation ecosystem in Croatia. Some aspects of the design approach are prescribed by EU regulation (e.g., the obligation to prepare ex ante evaluations for all thematic objectives in one document). Pan-European innovation strategies are often accepted as the analytical basis for public support, but they should be also complemented with a diagnosis in the context of individual economies. The abundance of innovation financing for Central and Eastern European (CEE) countries, including Croatia, is also conducive to this situation. Most programs have to be designed at the same time for the seven-year programming period, which can be challenging if institutions are

facing capacity constraints. Uncertainties related to frequent changes of timeline and regulations can add difficulty to an already challenging environment.

**Adoption in Croatia of best practices from other countries is not preceded by honest assessment of the necessary human and financial resources needed to implement them.**

While the use of evidence — even from a different country — is a critical guide to selecting and designing instruments, the approach creates some significant risks. Incomplete institutional capacity can lead to importing policy designs and practices that may look good on paper but are not appropriate to the local context and do not achieve the desired results; this is a practice that has been labelled *isomorphic mimicry* (Andrews, Pritchett, and Woolcock 2012). For example, Croatia’s project selection process for scientific programs is organized similarly to those of highly developed countries, although it lacks the institutional capacity to develop a network of high-quality reviewers.<sup>22</sup>

**Substandard innovation policy design is associated with incomplete consideration of the factors needed to achieve the desired impact.**

Programs may fail to produce the desired impact for various reasons. While no mechanistic way to undertake innovation policy will guarantee the desired impact, robust principles and processes applied in the design stage can minimize the risk. Problems especially arise when:

- The problem identification is poor;
- The local context differs significantly from the one in which the instrument is meant to work;
- Implementation capabilities are low;
- Expectations for the impact or the amount of time required are unreasonable; or
- The resources allocated do not match the task (Cirera et al. 2020).

### What are global best practices? DOs and DON'Ts

**Sound rationales and designs for specific policy instruments increase the chances of successful implementation.** Having a sound rationale requires correctly identifying the problem that is impeding innovation and choosing the appropriate instrument(s) to address it. Having a sound design requires creating a clear logic model that establishes direct and plausible connections between the problem, the chosen courses of action, and the desired outcomes. Having a sound rationale and design can help minimize the risks inherent to an intervention.

**Well-developed logic models and clearly identified market and system failures can aide the process of innovation policy making and minimize the risks of failure.** First, properly using logic models as design tools helps address deficiencies in design practice.

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<sup>22</sup> Shortcomings in the composition of review panels are described in detail in section 3.6.

Well applied logic models require answers to most of the questions that must satisfy an informed critical audience.<sup>23</sup> Second, the design of every support program should center on a well-documented market or system failure. If the justification for government intervention is faulty, however, even using a high-quality logic model would lead to unsatisfactory results. The most frequent market and system failures related to innovations in the economy include (i) problems with the appropriability of external benefits, (ii) imperfect and asymmetric information, (iii) coordination failures, and (iv) missing or underdeveloped markets (Cirera et al. 2020).

**Preparing high-quality justifications requires that innovation authorities have appropriate analytic capabilities.** Public administration organizations often struggle with hiring and retaining talent,<sup>24</sup> and employee costs are treated as unnecessary overhead. People with adequate skills and education are necessary for conducting proper diagnoses, however, and the benefits from higher returns on public investment more than justify paying higher salaries to skilled professionals. For example, innovation agencies in the United States hire PhD graduates from top universities to increase the probability of selecting appropriate designs for public interventions. Even though salaries in the agencies dealing with the EU funds in Croatia are higher than the average for public administration, they might not be high enough to attract a sufficient number of people with the necessary competencies. Depending on the challenge, developing a thorough justification could benefit from the perspective of other institutions in the ecosystem. For example, to stimulate industry-science collaboration, organizations dedicated to bridging the research and private sector can provide a unique perspective and experience.

**Coherence and complementarities across policy instruments must be ensured.** The efficacy of innovation policies often depends on the interactions between policy instruments. For example, the success of an instrument to create technology transfer offices to support university-industry collaboration will critically depend on existing policies to support the quality of applied research, on universities' incentives to work with the private sector, and on creating demand from industry. University policies supporting and incentivizing technology transfer, innovation and industry engagement are critical; but, these policy positions must be coordinated and overlaid with policies related to researcher evaluation, tenure and promotion, royalty sharing, etc. Policies that promote engagement with innovation and technology transfer, but then penalize researchers for failure to achieve major impact in more traditional academic measures, is highly counterproductive. Significant coordination is therefore needed, possibly across government agencies, given that science, technology, and research policy functions are often separated from industrial policy.

**Consideration should be given to the additionality between the instrument proposed and other existing instruments.** A critical element to guide this process is the inclusion of well-articulated goals and, more importantly, the logic model of the intervention. Developing a logic model will help policy makers consider all internal and external elements that may influence the project and pinpoint what could go wrong, as well as setting the framework to guide monitoring and evaluation (M&E).

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<sup>23</sup> For more information about best practices related specifically to logic models, consult section 3.3.  
<sup>24</sup> For more on this topic, consult section 3.8.

**Policy consistency and predictability over time is a key contributor to overall coherence.**

Some of the objectives of innovation policy, such as higher R&D intensity, can only be achieved over the medium to long term and require sustained support. Policy consistency and predictability over time is therefore crucial. In the European context, maintaining continuity between seven-year-long multiannual financial frameworks is challenging. Priorities for spending and rules governing design and disbursement of support change, with little or no regard to economic conditions in individual member states.

**Design interventions can help avoid capture.** Many changes in the EU financial framework miss the specific conditions of local contexts of individual member states and may also be driven by political factors. Similar situations arise at the national level. Thus, it is important to design interventions to avoid capture. The likelihood of policy capture is higher in countries with less established institutions with limited monitoring capacity and weaker autonomy from political interference. Having a broad set of actors behind policy design can help minimize capture. For example, private sector participation on boards of directors or research institutions can sometimes help guide the overall direction toward industry collaboration. Similarly, using external experts, both local and international, to evaluate project proposals ensures greater autonomy and can help protect the application process from political interference.

**Design mechanisms can minimize market distortions and avoid crowding out viable businesses.** Publicly funded cofinance loans and grant schemes should consider existing financing options offered to firms by commercial banks and avoid introducing unfair competition to potential lenders. In addition, understanding alternative options available to small and medium enterprises (SMEs) can make interventions more relevant to them, especially since in many countries they already have a favorable regulatory and tax situation. By ensuring that support instruments truly respond to legitimate needs in the economy, public interventions will catalyze underdeveloped markets, adding dynamism and steering competition.

**Risks associated with the design and delivery of innovation policies are unavoidable, but their occurrence can be minimized.** A good example of a practical checklist for program managers that highlights various actions that could be helpful for successful advancement of innovation objectives can be found in Cirera et al. (2020). The referenced checklist is suitable for guiding the design process of various instruments targeting private enterprises. It will help MAs and IBs to shape programs in both innovation and entrepreneurship.



**Table 3.2** Success factors in development of logical models

✓ **DOs**

- Assess whether innovation agencies have the human and financial resources needed to successfully design and implement instruments.
- Design instruments with the conception of market failure or system failure at their core — make considerations related to these topics mandatory in the EU regulations.
- Attend to the complementarities between the instrument proposed and other existing instruments.
- Weigh the relative strengths of markets and government. Rely where possible on the provision of services by the private sector or public-private partnerships, reducing the demands on the government (Howlett and Ramesh 2014).
- Use external services to provide support if domestic capabilities do not yet exist (e.g., for specialized advisory services in areas such as technology adoption or managerial skills).
- Introduce explicit mechanisms for the participation of private sector stakeholders in the design process.

✗ **DON'Ts**

- Don't use copy-and-paste innovation policies from other countries. Every program originated abroad should be adapted to the Croatian context.
- Don't assume that a particular support instrument is necessary for the economy. Specific needs must be diagnosed in each situation.
- Don't rely merely on information on demand from beneficiaries of particular interventions as a basis for its justification. For example, most firms will always indicate lack of finance as one of the main constraints on innovative activities, regardless of the availability of financial services on the market.
- Don't let political interference set objectives or justification of instruments.
- Don't think about design or mechanics of the intervention without regard to implementation — instruments should be practical to avoid problems during later stages of their life cycles.

Source: Staff elaboration.

## 3.3 Using logic models as a best practice in policy design



### Why is this important?

**A logic model is a critical element of instrument design.**<sup>25</sup> Weak policy design often relates to mistaken assumptions about the context of an intervention, incorrect understanding of the effects of an intervention, or a lack of consideration of alternative instruments to those policy makers typically use. The logic model documents how an instrument is supposed to work. Its development helps policy makers consider all the internal and external elements that may influence or enable the program and the risks to implementation, as well as setting the framework to guide M&E (Cirera et al. 2020).

**A logic model represents the full operation of the instrument and connects all resources (inputs) and activities to the products (outputs) and results (outcomes) expected from an intervention.** Logic models make assumptions about an intervention explicit and elucidate a “theory of change” or the causal mechanism that is expected to produce the desired effects on the system (the system of innovation, the business community, or any other society-level entity) (Gugerty and Karlan 2018).

**Without a logic model, many components of the instrument go unexamined, leading to numerous unintended consequences, most of them undesirable.** These undesirable consequences often could have been anticipated and prevented with a better design. The logic model also helps communicate to all parties that become involved with the instrument how it is supposed to work and what it is supposed to achieve. It is well known among public policy researchers that policy designers and implementers are generally not the same offices or teams. As a result, whatever documents are produced to specify the design are interpreted by others in the context of implementation, very frequently leading to adjustments not fully compatible with the intent of the design. Furthermore, without a logic model, these adjustments are not contrasted with the specifics of the design or considered as part of future versions of the instrument. The logic model provides a structure for documenting adjustments and implementing changes in future versions of the instrument, thus supporting continuity with subsequent interventions and increasing the likelihood that lessons learned will not be forgotten.

### What is not working well in Croatia?

**The vast majority of the instruments analyzed in the Public Expenditure Review (PER) functional analysis do not have explicitly developed logic models.** Managers of most interventions are only implicitly aware of relationships that connect inputs, activities, and outputs to outcomes and impacts, with various degrees of completeness between

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<sup>25</sup> Logic models are also sometimes called “logic frameworks” or “logframes,” “theory of change models,” or simply “theories of change” or “program matrixes,” among other similar labels. We will use the term “logic models” throughout.

programs. In programs that have logic models, the logic models are perceived as helpful tools to inform management and implementation decisions.

**Outputs are the only fully catalogued component of logic models, in the form of program supplements.** Even when all elements of the logic model are considered to some extent in the design stage, they are not covered completely, so the logic model does not correctly represent the operation of the instrument. The instrument design lacks a connection between inputs and activities, on the one hand, and the rest of the expected operation, on the other. The interaction between various design elements is recognized only implicitly: it is unclear how inputs will translate into activities and how activities will eventually lead to achieving the stated objectives. Program managers hold unexpressed assumptions connecting parts of the instrument mechanics (for example, assumptions regarding the automatic impact of products and outputs of the intervention on changes in the broader economy). These assumptions are rarely stated or analyzed.

**Most public instruments supporting R&D and innovation in Croatia do not have fully developed logic models.** ESIF regulations oblige managing authorities (MAs) to present a comprehensive catalog of activities and products in a kind of program complement. These constitute only a part of the logic model, however. Inputs, outcomes, and the connections between all of the above elements are only implicitly recognized by the managers. The most severe consequences of the lack of logic models may occur in programs with large budgets, where shortcomings in program logic can have a major impact on the efficacy of public spending.

### Areas for improvement

**Greater awareness of the usefulness of explicit logic models is needed as are administrative incentives to develop and use them.** The EU and national regulations specify a detailed set of procedures to be followed over the course of the design and implementation of public support programs. These do not explicitly mention logic models, however. Provisions for selected programs (for example, the Croatian-Swiss Partnership Framework and past World Bank guidelines) included requirements to develop logic models that not only led to their creation but also stimulated program managers to broaden their knowledge of this area.

**The use of logic models as the main design tool could be extended to all MAs, building on experiences from international programs.** Limited time is available for programming projects cofinanced by the EU. Budget negotiations preceding adoption of the upcoming round of programming are even more prolonged than those for the 2014–2020 Multiannual Financial Framework (MFF), leaving less time for authorities to fine-tune planned interventions (Gasper 2010). Logic models can speed up work on preparing instruments by guiding and structuring the design process. Thus, their broad use in preparation for the 2021–2027 MFF programming period could be crucial in ensuring that effective public interventions are designed under time pressure. Although the Croatian authorities have been directly responsible for preparing logic models in certain international programs, this experience has not led to the permanent inclusion of logic models in the design of other interventions. Some Croatian authorities' experience working with logic models in international programs could be disseminated and broadly used in programming interventions for the 2021–2027 MFF.

## What are global best practices? DOs and DON'Ts

**The quality of logic models depends on both the scope of information they contain and how the information is acquired.** First, a well-developed logic model will include all relevant items in enough detail to show the coherence of the theory underlying the policy. It will also provide the sources of evidence and means of measurement of those items. Second, logic models should be the result of thoroughgoing collaborative processes with stakeholder involvement (that is, they should acknowledge the political dimension). Only extensive consultations can guarantee that all inputs, activities, and outputs are included in the model, with sound relations between them and the desired outcomes.

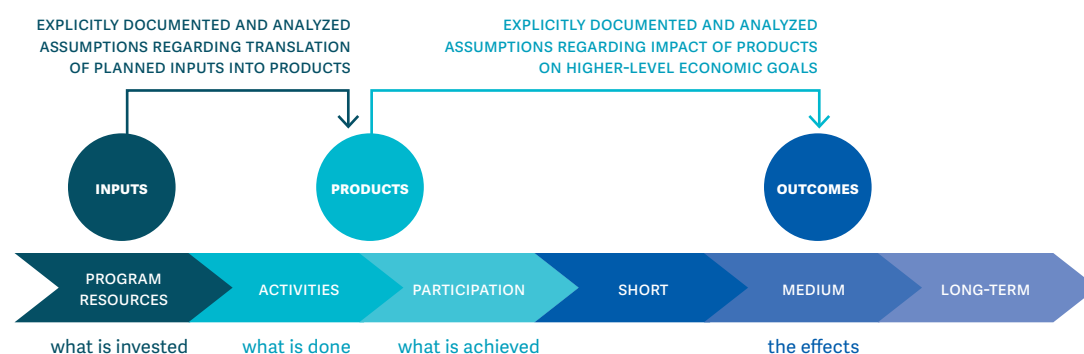
**Best practice includes creating logic models not only for new programs but also for instruments already being implemented.** For new programs, the process begins by identifying the problem or need that the program is intended to address. For instruments already under implementation, developing a logic model is an opportunity to evaluate assumptions and ask whether sufficient evidence exists to support the current strategy. Either way, the process of developing a logic model strengthens programs.

**Best practices regarding the use of logic models in Croatia can be found in instruments cofinanced from Swiss funds.** For the Croatian-Swiss Research Program (CSRP) and the Tenure Track Pilot Program (TTPP), the Swiss donor required the development of logic models as a precondition for obtaining financing. After preparing logic models, CSRP managers perceived them as useful design tools. They did not develop logic models in programs cofinanced by the EU and national resources, however, because it was not formally required.

**The recommended approach to developing logic models includes seven steps** (Gugerty and Karlan 2018):

1. Define the problem and intended results.
2. Define program activities and inputs necessary for them.
3. Identify program outputs.
4. Define the program outcomes that determine impact.
5. Identify assumptions.
6. Consider nonprogram factors that also cause changes.
7. Identify risks and unintended consequences.

**Figure 3.1** Logic model



Source: Gugerty and Karlan (2018).

**Logic models or some variation of them are often required by agency regulations, which is well-intended but may not have the expected result.** A logic model constructed in a formulaic manner to “tick boxes” and merely satisfy a bureaucratic requirement will not be as effective as one built with careful attention to detail. Furthermore, a logic model must be a working document or process that contributes to improved performance. Therefore, instrument managers and implementers must “own” the logic model. Best practices, such as this one, are often better adopted through incentive systems and training than through authoritative requirements.

**Table 3.3** Success factors in the development of logic models

✓ **DOs**

- Develop logic models even for instruments that have been in implementation for some time: it is never too late for a good theory.
- To cover all relevant items in sufficient detail and show the coherence of the policy theory, organize work on a logic model as a collaborative process with stakeholder involvement.
- Ensure high quality in terms of the logic model’s articulation and feasibility.
- Ensure the measurability of all items in the logic model.
- Develop the capacity of program designers to articulate the logic model in public interventions.
- Use logic models regularly to inform managerial decisions and revise programs regularly.

✗ **DON'Ts**

- Don’t consider logic models as only a compliance tool, rather than as a viable component of policy/ instrument design.
- Don’t create logic models merely as a box-ticking exercise in reaction to formal requirements.
- Don’t focus only on outputs; instead, connect inputs to activities, activities to outputs, and finally outputs to impact and longer-term changes in the economy.
- Don’t rely on legal requirements to promote the development of logic models.

Source: Staff elaboration.

## 3.4 Setting program objectives



### Why is this important?

**A precise definition of objectives is necessary to determine the desired outcomes and impacts of a program.** Objectives are the starting point in the determination of the logic model of a policy instrument.<sup>26</sup> Without clearly defined objectives connected to high-level expected outcomes, it is difficult to understand the components of the logic model and clarify the assumptions that link them. The lack of properly defined objectives also hinders drawing a distinction between short-term outputs and long-term outcomes of any program. Outcomes must be distinguished from outputs to guarantee they are not merely what an activity produces but contribute to an actual, system-level change to a more desirable state of affairs.

**Without appropriate objectives, it is challenging to monitor the progress of a program.** It cannot be determined whether the goals will be reached, and the intervention is successful. This problem arises in two particular cases. First, where multiple instruments share the same objectives, the contributions of individual instruments toward the goals cannot be distinguished. Second, instruments may have objectives described at too low a level. In the second case, a program could look successful on paper, fulfilling targets related to outputs, but offer no certainty that outputs will translate into impacts on the economy (Gugerty and Karlan 2018).

### What is not working well in Croatia?

**In almost all innovation support programs reviewed in the PER, a gap existed between the system level objectives stated in the agreement with the European Commission and those specified for the programs themselves.** The general Operational Program objectives focus on increased productivity in the economy, R&D spending as a percentage of GDP, and so forth. Individual programs, however, specify only targets at the beneficiary level or even at the program participation level. In other words, most objectives indicated for programs are merely activity outputs; no connection to system-level objectives is articulated. For this reason, the program planning — including justifications; short, medium-, and long-term impacts; and relationship between outputs and outcomes — are insufficiently specified. Good practices were observed in the Installation, Research Projects, and PoC grants. In all these cases, the modality of the intervention was chosen to achieve the fit of the program objectives with the needs of Croatia's scientific sector and to maximize long-term impact. The objectives of Integrated Territorial Investment programs for innovation were designed with full acknowledgement of high-level plans specified in the regional development strategy. Similar fit with strategic goals can also be observed in the TTO and R&D Infrastructure programs.

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<sup>26</sup> More on the topic of logic models is described in section 3.3.

**Numerous support programs serve multiple objectives, making it difficult to maintain focus during implementation and assess their effectiveness** (World Bank 2019). More targeted programs that tackle one or two specific objectives would help tailor program elements to desired changes in the economy. Best practices in program design should include at least an argument for the connection between its own results and the system-level objectives, following subsequent steps of the logic model. Without this, programs risk becoming self-justifying and could be repeated over many funding cycles simply out of comfort with their implementation. They become integrated into the culture of the agencies rather than serving as a means toward STI policy ends. This makes programs vulnerable to co-optation by stakeholders (for example, the influence of representatives from the academic community, business sectors, or political groups) seeking a particular benefit rather than the improved effectiveness of interventions.

### Areas for improvement

**The tendency to establish objectives at the level of the priority axis and investment priority is largely due to EU regulations regarding ESIF.** ESIF currently provide the main support for STI programs in Croatia. The Common Provision Regulation obliges MAs to provide a list of objectives for each priority axis, and negotiations between the Member States and the EC take place at this level of detail. To obtain approval from the EC, program objectives must connect to higher-level objectives and economic strategies. A single priority axis includes numerous support programs, however, often more than a dozen.

**The STI agenda is fragmented into multiple institutions, making it even more difficult to connect the objectives of individual instruments to higher-level outcomes.** Aside from the issue of setting shared objectives for numerous programs, other shortcomings relate to the quality of their connection with systemic change in the economy. For many instruments, objectives only refer to products of the intervention and not to systemic changes that policy makers would like to achieve (e.g., the number of PhD positions funded rather than the increased international competitiveness of Croatian science). Part of the reason for this is that authorities are not trained to use logic models for program design and to calculate the impact of an intervention (or they do not see the benefits of doing so). The focus tends to be on developing capacities for the speedy disbursement of funds.

### What are global best practices? DOs and DON'Ts

**Best practice is to define objectives in such a way that they reduce ambiguity and conflict.** To accomplish this, goals must be clearly articulated, realistic, observable, and measurable, as opposed to abstract, implicit, and generic. They must be clearly and explicitly stated and linked to the desired system-level changes. They must be realistic and both observable and measurable, as opposed to being specified only in kind and incommensurate with a path to success. Existence of explicit objectives and goals connects an instrument to desired higher-level changes (e.g., productivity or knowledge base) (Cirera et al. 2020).

**Table 3.4** Success factors in setting program objectives

### ✓ DOs

- Set clear, measurable objectives connected to the desired system-level changes in the economy (such as how much improvement of how many firms will improve productivity, contribute to the share of high-tech exports, etc.). Ensure that the link is clear and that the underlying causal mechanism is evidenced in the literature.
- Always determine realistic targets for objectives and specify the approach for measuring progress over the course of implementation.
- Select appropriate instruments for specific individual objectives. (For example, vouchers are usually appropriate to induce SMEs' collaboration with knowledge organizations and knowledge providers to develop innovative projects, whereas loans for innovation could be helpful when the innovation problem relates to financial imperfections on the market.)
- Use intermediate outcome milestones to allow progress monitoring toward achievement of impacts. These can be in terms of both intensity of outcome and time to achievement (short-, medium-, and long-term outcomes).
- Design program objectives related to the modality of support and local context.
- Consider the complementarity of instruments that build on each other, either in sequence (e.g., scholarships for education followed by incentives to hire graduates) or in parallel (e.g., support for innovation projects and creation of financial interventions, such as venture capital).
- Relate the objectives of a particular program to the outcomes of another policy that supports the next stage of development of innovation (e.g., a program aiming to support creation of proof of concept might also have objectives related to the success of its beneficiaries during later stages of innovation development).

### ✗ DON'Ts

- Don't design several instruments with a shared set of objectives and without clearly designed complementarities.
- Don't try to achieve too many policy objectives through one program. Every intervention should have a clearly designed objective targeting a particular innovation problem.
- Don't restrict objectives only to products and outputs of intervention.
- Don't provide organizations with the same or similar objectives — an example is multiple funding schemes in different agencies targeting the same population of beneficiaries with similar objectives. Such situations could lead to competition and undermine the effectiveness of individual instruments.

Source: Staff elaboration.

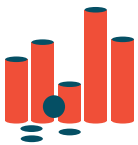


**Even if the desired change in the economy is general and broad, best practice is to show how each individual intervention will contribute to system-level goals.** When instruments are relatively small, its impact on the population level needs to be defined — it creates a platform for calculating impact on the whole economy. For this reason, sound M&E systems are necessary to provide information showing that even small instruments make sense and create a platform for their expansion in the future. Specification of objectives may be informed by answers to the questions such as the following (Rodgers and Hunter 1992):

- Are the objectives clearly defined, observable, and measurable?
- Can the objectives be achieved on time, on budget, and to the government's expectations?
- Are critical success factors explicitly stated and the measurement approach specified?

**No well-established social science theories explain how specific interventions produce system-level changes.** The consensus in the literature draws inferences from individual cases to systems, but these are not sufficient to draw valid conclusions. Many of the phenomena we address do not aggregate well (that is, they do not achieve effects by simple addition of individual cases). The theory of the diffusion of innovations is not very helpful because it does not specify the mechanism of diffusion (Rogers 1982): it only characterizes the symptoms of a process of “contagion” or imitation of very limited actions.

**Even with the above limitation, it is best practice to set reachable targets for interventions that use rules of thumb regarding how to reach critical mass in certain sectors.** Therefore, setting targets, even just for learning how to adjust the instrument in successive cycles, is critically important. For example, if the government provides large incentives for high-tech companies to establish themselves in the country with the aim of diffusing advanced technologies to local firms, this “Building Government Capabilities for Innovation Policy” objective must be monitored. The lack of well-established theories can be compensated for with carefully documented experience in the context of interest. It may not generalize to all countries or regions, but it will be extremely informative as to what works in its own context. Table 3.4 summarizes best practices and practices to avoid regarding objectives.



## 3.5 Making funding more stable and predictable

### Why is this important?

**Technology and innovation are constantly changing, so their future course is very difficult to predict with precision.** Most businesses must make continuous adjustments to their strategies to stay viable and competitive in the market. One of the key factors for an innovation ecosystem that seeks to foster innovation and a willingness to take risks in technology-intensive markets is the stability of its general rules and the type and availability of financial resources. The public sector may play a secondary role in providing finance for the ecosystem as such, but the background stability of the system is guaranteed by general rules and the providers of baseline funding. In this regard, the stability of the government's commitment plays an important role in mitigating the risk inherent to research and innovation and reducing uncertainty for business decision making.

**Short-term changes in the levels and availability of funding seen in most developing nations clearly correlate with the uncertainty that inhibits firms' investment in innovation.** Evidence indicates that temporary measures, as compared to more stable financing, lead to less desirable results (Appelt et al. 2016; Kuusi, Cuhls, and Steinmuller 2016). The results support the premise that R&D investments require significant initial costs and that returns take time to mature. For example, early stage innovation takes a very long time for development, validation, and market introduction and penetration, contributing to the high risk in the context of innovation. The availability of stable and adequate financial resources is thus a straightforward requirement for a successful support instrument.

**Policy consistency and predictability are crucial for achieving results, especially because the life cycle of investments in innovation tends to be long.** Business innovation typically requires firms to make nontrivial decisions concerning the allocation of resources. These decisions are often tied to capital and financial commitments. Policy uncertainty can deter firms from allocating financial and management resources to upgrade their own capabilities. By the same token, targeted policies aiming to develop capabilities at the level of the National Innovation System require irreversible financial commitments from several stakeholders. One example is the length of the cycle required to accumulate human capital and establish connections between university and industry, a critical factor in the extended National Innovation System. The lead time from the conception of a new skill curriculum to graduation of the first cohort of professionals can be as long as five to ten years (Cirera et al. 2020).

### **What is not working in Croatia?**

**Lack of predictability of funding makes it difficult to achieve desired policy objectives.** Especially in the case of programs funded from national resources, changes in the political or economic landscape create significant volatility in budget allocations. After Croatia joined the European Union, programs outside the ESIF framework seemed to be marginalized and fall to lower priority on the government's agenda (World Bank 2019). This resulted in limited financing predictability for some nationally-funded programs, making it difficult for researchers and entrepreneurs to plan their activities. Potential beneficiaries do not know whether in the future other programs (or another version of an existing program) will support their projects.

**Many programs have only one call, which further limits funding stability and increases administrative costs.** Calls are often delayed, making applicants' planning even more difficult. Postponement of calls eventually leads to fewer calls: 63 of 78 R&D programs implemented in 2014–2020 had only one call (World Bank 2019). Programs with one call do not benefit from economies of scale, reducing return on public investment. Innovation is often serendipitous and unpredictable, and one or few time-limited opportunities to obtain funding will likely not be sufficient. Multiple calls also provide opportunities to implement adjustments more often than just once every seven years (the length of EU financing cycles).

**Some programs continue with inadequate resources due to their political or symbolic value or the interests of the implementing agency, while others are abandoned despite having good results.** For instance, the nationally funded Proof of Concept program, which has been successful in the past, was sidelined due to preoccupation with European Regional Development Fund (ERDF) programs. The Eureka and Eurostars initiatives are financed mostly

due to their brand value, despite low interest and limited fit with the needs of the Croatian economy. UKF is recognized for its research excellence, yet its sustainability is not secure, and it is unlikely to receive more financing in the near future.

### Areas for improvement

**Innovation authorities need to pay more attention to planning and organizing multiple calls.** A staged approach toward disbursement of funds has numerous benefits; however, executing such approaches in practice requires that innovation authorities have well-developed implementation capabilities. The innovation support ecosystem in Croatia is relatively young. Some IBs are still building their operational potential, which is currently insufficient for managing numerous calls. Limited long-term planning results in a poor fit between the intervention and the policy mix, and various factors consequently may reduce the instrument's effectiveness in influencing decisions on financing. These factors include: (i) political reasons (shifting focus to European funds from other sources of funding); (ii) bureaucratic inertia (continuing some programs because of their long implementation history, with little or no need assessment); and (iii) regulatory reasons (budget allocations are determined in reaction to changes in funding regulations, with no clear economic justification). Focus on various sources of funding is necessary to ensure stability and predictability. Moreover, the EU's seven-year planning framework permits longer-term consideration, and Croatia should take advantage of it, which it is not currently doing.

### What are global best practices? DOs and DON'Ts

**Best practice keeps the evolution of funding over the medium to long term as stable and highly predictable as possible.** This is so in the best innovation systems, even as the emphasis of specific instruments changes in response to the business community's changing needs. EU financing regulations provide proper conditions for guaranteeing funding predictability: each Member State is allowed to plan support program implementation for seven years (with three additional years to disburse money under active contracts with beneficiaries). Some of the countries with the most significant, rapid development in technological capabilities follow this pattern. Most adopted a commitment to progressive growth in funding that they have kept for decades.<sup>27</sup>

**Predictability and long-term certainty of funding are crucial requirements for replicability of known critical success factors.** All of the case studies cited in the WB review of best practices in innovation support instruments were based on programs implemented for periods longer than seven years (Cirera et al. 2020). Other experiences from OECD countries suggest that a commitment to innovation support schemes should last a minimum of five years (although more is preferable) to provide firms the planning time frames required for R&D investments.

**A larger number of calls provides space for learning and could provide benefits even in programs with relatively low budgets.** All support programs require modifications during

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<sup>27</sup> See, for example, the case of Israel described in Box 2.1 in section 2.

implementation. By announcing a framework plan of calls covering the duration of the intervention, program managers acquire experience for improving their activities. The framework also allows potential applicants to plan investments. In Poland, which has long experience with implementing EU cofinanced programs, the vast majority of interventions have multiple calls, including targeted regional programs with budgets smaller than EUR 10 million.

**Policy consistency and predictability are important to develop the National Innovation System.** The policy cycle ideally follows a sequence of functions, including diagnostics and analysis of options, setting objectives, policy integration, implementation, and management. This sequence, and the individual steps, should not be shortened for political or budgetary reasons. In many countries, incoming administrations tend to dramatically redefine the policy agenda, reversing many program advances already made. An appropriate diagnosis to inform the design of support instruments reduces the influence of political factors as a threat to budgetary continuity. Moreover, innovation agencies need to possess broadly defined capabilities, including the ability to interact with the political environment to generate political commitments for sustained funding that ensures budget predictability.

**Budgetary stability is needed to ensure continuity, particularly for programs aimed at collaboration.** Collaborations generally take a considerable amount of time to develop effectively. To last long enough to ensure impact, grant schemes require consistent, predictable levels of funding. Such consistent funding requires a high level of political commitment and support, which can be difficult to obtain during recessions or periods of fiscal stress. In EU cofinanced programs, additional risk relates to priorities that change between financial cycles (for example, abandoning the BSO supply financing model in favor of an approach focused on demand).

**Table 3.5** Success factors in preparation of budgetary management of support instruments

✓ **DOs**

- Seek to ensure political commitment, funding predictability, and policy continuity, because constant changes and unpredictability can make attracting good applicants difficult.
- Specify the duration of incentive schemes. In many cases, policy makers have left terms relatively open-ended to ensure predictability and encourage companies to undertake long-term planning. This, however, has implications for budget planning over the medium term.
- Maintain policy consistency and predictability of support and effort. These are also important for sustaining the network and promoting innovation.

✗ **DON'Ts**

- Don't frequently change scheme features (such as eligible expenditures and exemption characteristics). R&D investment decisions need predictability over time; a commitment of at least five years is desirable.

Source: Staff elaboration.



## 3.6 Assembling high-quality review panels

### Why is this important?

**High-quality expert reviewers increase the effectiveness of funding programs by selecting projects with the highest returns on investment.** In most grant schemes, panels of experts or peer reviewers evaluate proposals. The composition and management of these panels is critical for obtaining high-quality proposal evaluations. Better composition and management would allow more accurate assessment of whether potential beneficiaries are competent to deliver the proposed project. Reviewers must be able to assess the motivation of potential beneficiaries and their expected contributions. Reviewers' willingness to invest in conducting the necessary assessment of proposals, planning activities, and evaluating projects for which funding has been granted after implementation are also preconditions for an intervention's success (Cirera et al. 2020). Moreover, the process of evaluating proposals can also serve the purpose of accrediting a firm's competences, which can effectively address the information asymmetry for private investors and might result in additional benefits to applicants.

**Establishing well-functioning review mechanisms, while challenging, is crucial if support instruments are to function properly.** Review panels are often used in the selection process for collective decision-making. The format allows for open discussion among experts from different perspectives and can be helpful in overcoming hidden bias. However, it is necessary to also be aware of the risks of this approach. Well-known group dynamics may affect the quality and consistency of panel reviews. These include "groupthink," dominant members, and ignoring ideological differences between members. Even the most competent personnel acting individually, without specifically designed moderating mechanisms, will not be able to ensure consistency. Panel decision making is further complicated by differences in standards, interpretation, capture, and risk aversion among panel members. Such difficulties lead to haphazard financial support decisions.

**Access to high-quality experts for effective selection panels requires a developed network of experienced local and international experts.** The risk of biased project selection is especially high in small countries that do not have sufficiently large scientific or practitioner communities to prevent conflicts of interest (Khan 2015). Therefore, participation of international experts in the peer review process is a necessary condition for the effectiveness of programs that finance scientific research or advanced business R&D. A viable roster of potential reviewers requires a good network of international scientists and practitioners in addition to institutional connections with innovation agencies abroad. For small countries, the availability of a large enough pool of independent reviewers is even more of a challenge. It is especially severe for more specialized interventions (e.g., in sectors with a small number of firms or in specialized research areas) because "everyone knows everyone."

### What is not working well in Croatia?

**Many programs in Croatia are significantly limited by the unavailability of reviewers and recruiting them is very challenging.** This stems mostly from three factors: (i) the

requirement that proposals should be written in Croatian (except for a few international programs), (ii) the small pool of local expert reviewers, and (iii) unattractive remuneration for potential international reviewers. A limited pool of reviewers creates conditions rife with conflicts of interest. The problem is amplified by language requirements and other regulations affecting the availability of high-quality reviewers. In Croatia, a small country, it is close to impossible to find experts who are truly independent and possess the specialized expertise needed to review scientific proposals.

**The application review process is slow because it is distributed across several bodies.**

IB1 and IB2 have distinct roles in the review process. Usually, IB1 manages the quality peer review process, and IB2 conducts an administrative check and other selection process tasks, such as budget clearing. This division creates a vulnerability if tacit knowledge on the details of projects under review and a sense of their quality and potential are not shared.

**Rigid panel composition procedures reduce flexibility for hiring experts, creating delays in the review process.**

Implementing bodies in Croatia usually wait for completion of the application process before they employ experts for the merit assessment. As a result (especially in more specialized calls), either review panels are composed under time pressure, compromising their competence, or the selection process is simply delayed. For some programs with shortages of reviewers, the evaluation process has taken around two years.

## Areas for improvement

**The application review process must be carefully thought through at the design stage.**

Critical assessment is required because selecting projects of inadequate quality may significantly affect program effectiveness. Interviews with program managers revealed that limited efforts are made to prepare solid review guidelines and implement good practices, leading to suboptimal panel composition. Reviewers are more likely to serve – and continue to serve – on panels that follow clear guidelines. Further, more should be done to develop solid reviewer networks. When designing the approach to review panels, Croatian institutions engaged in STI policy at times seem to focus mostly on meeting formal requirements resulting from regulations, rather than on guaranteeing the evaluation committee’s full legitimacy.

## What are global best practices? DOs and DON'Ts

**Successful agencies maintain healthy pools of experts.** U.S. agencies such as the Environmental Protection Agency, National Institutes of Health, and National Science Foundation have manuals and carefully designed instructions on how to set up and run project proposal review panels. It is a best practice in granting agencies in developed countries to build reviewer networks as part of the agency infrastructure around each program. Agencies maintain rosters of reviewers, even when they have only a few projects to review. At the international level, the Research Competitiveness Program of the American Association for the Advancement of Science (AAAS) is a best practice example for providing strategic assessment, peer review, training, and programs for innovation and entrepreneurship. Good practice is demonstrated by the ex ante reviewer network set up by HAMAG-BICRO that enables them to line reviewers up easily and quickly.

**Table 3.6** Success factors in topics related to review panels

✓ **DOs**

- Select relevant and independent experts using a justified, transparent process.
- Recruit experts from abroad when needed (e.g., when there is risk of collusion — especially in instruments financing academic research — or lack of appropriate expertise among Croatian professionals).
- Develop guidelines specifying how to conduct the review panel to minimize the subjectivity and variability of individual panelists' assessments.
- Ensure that the review panel is appropriate to the nature of the instrument and proportionate to the investment and complexity of the work (European Science Foundation 2011).
- Provide incentives for domestic and foreign professionals (e.g., by organizing conferences and exchanging best practices) to review applications to Croatian innovation support programs.
- Develop an approach to create more opportunities to move toward English as the standard language for reviewer teams.
- Ensure that the application process is fully transparent and that proposals are evaluated and selected on their technical merits. All proposals submitted must be treated equally. They should be evaluated on their merits, regardless of their origin or the identity of the applicants.

✗ **DON'Ts**

- Don't limit the composition of review panels to domestic experts (even in the first stage of project evaluation).
- Don't overly rely on academics to assess applications related to business innovations and entrepreneurship development, because academics lack market orientation (Khan 2015).

Source: Staff elaboration.

**Developing a network of expert reviewers requires investments in institutional capacity.**

In countries with an innovation ecosystem close to the global frontier, funding agencies pay a lot of attention to hiring program officers with particularly good networks of scientists and other technical experts. Connections in academia or the high-tech industry are considered key institutional assets. Maintaining a viable expert network requires constant resources. Often, agencies hire practitioners in various science and technology fields temporarily as “rotators” who help them reach out to colleagues to develop a large and rich enough pool of reviewers to enable them to sustain grant schemes.

**The pool of experts should not be limited to academics: involvement of entrepreneurs and industry experts is crucial.**

It is essential to involve entrepreneurs and industry experts in panels evaluating business proposals, which in some countries are heavily captured by academics. It may be more challenging to engage such experts due to constrained availability and flexibility, especially if travel is required. Therefore, it would be necessary to assess these constraints in advance and find a way to mitigate them. A vast general literature on peer review must be taken into consideration when grant schemes play an important role in a policy domain. For example, using external experts in evaluating project proposals (such as in competitive grant programs) ensures greater autonomy and can help protect the application process from political interference. If the local pool of potential experts is small, consideration should be given to using foreign experts. Croatia may wish to explore collaboration with international organizations such as UNESCO and the European Union to access databases of experts who could act as potential reviewers (Jacob 2014).

## 3.7 Setting effective selection criteria



### Why is this important?

**Good selection criteria are necessary to identify the projects most likely to meet program goals.**

The selection process may be carried out as an ongoing activity, if the call receives proposals over an extended time, or as a batch process, if the call has fixed deadlines and initiates proposal review after they pass. Grant schemes are the tools most-used in Croatia to disburse innovation support. Their effectiveness depends heavily on awarding support to the right projects and beneficiaries. If the target beneficiaries are not those who will produce the desired policy results, the loss is double: scarce government resources are wasted, and the government’s reputation as an enabler of innovation activities in the economy is seriously damaged. Selection criteria should thus be consistent with the logic of the instruments and should demonstrate an attempt to reach the target population capable of maximizing program results.

**The distinction between project selection criteria and beneficiary eligibility criteria is crucial.**

The latter specify the pool of actors eligible to apply for funding (e.g., micro firms or young researchers). The former criteria define the innovation activities and the quality of the solution that the instrument is meant to support (e.g., projects to advance basic research in STEM scientific disciplines). Selection criteria should focus on the technical content of the projects the instrument seeks to enable, under the assumption that technical content is the vehicle for achieving the policy’s goals. They provide the framework for



judging the quality and appropriateness of the project activities to be supported and are the means of targeting the optimal activities for achieving the technological innovation goals. Selection criteria design requires sophisticated capabilities on the part of the agency implementing the instrument as well as good understanding of the recipients of support.

### What is not working well in Croatia?

**Several innovation policy programs have generic selection criteria that do not target projects with specific desirable characteristics.** The criteria mostly relate to high level, abstract priorities such as compliance with a general policy strategy (e.g., the Smart Specialization Strategy). The sudden increase of resources provided by the EC created the challenge of disbursing the funds in a timely manner. Some criteria are vague. For example, one program refers to an “acceptable ratio of expenditures to results” as a measure of value for money, without defining what “acceptable” means. While some flexibility is needed in evaluating the quality of projects, such vague definitions leave room for arbitrary interpretation and may result in uncertainty and lack of trust on the part of applicants. This is compounded by the fact that selection criteria and methodology have not been part of the public consultation process so far.

**Some current selection criteria decrease program functionality.** The criteria do not allow clear identification of innovations that face market failure and a high level of risk but otherwise offer a high potential reward. In many cases, programs overemphasize economic viability by favoring projects that are closer to the market. They don’t capture — and may even penalize — higher-risk activities. This approach may result in selecting projects that were created for the sole purpose of obtaining public financing, even though they have low market potential over the long term. Part of the problem is the rigid system governing the methodology for assessing the quality of projects in OPCC, as defined in the Common National Rules (CNR). (See Section 4 for more details.) Currently, each criterion must be integrated in one of ten areas<sup>28</sup> defined by the CNR. Moreover, selection criteria are rarely improved between calls (often because only one call is held per program). The learning process could be enhanced by dividing the budget of programs into more multiple calls, providing an opportunity for fine-tuning the calls in subsequent funding cycles.

**Most instruments operate with underdeveloped targeting strategies.** Selection criteria are driven by regulations related to the source of funding (e.g., the Common National Rules) and do not allow targeting the group of beneficiaries with the highest potential. Examples of broad selection criteria can be found in the ICT2, and Internationalization through BSOs.

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<sup>28</sup> These areas are value for money, financial sustainability, implementation capacity of the applicant (and, if applicable, the partner), design and maturity of the project, promoting equal opportunities and social inclusion, promoting sustainable development, contribution of the project proposal to solving specific development problems in a specific territory, links to other projects relevant to the sector concerned, scope and strength of the partnership, and innovativeness of the project implementation plan. The latter four areas are mandatory only if applicable.

**Good practices with regard to selection criteria among Croatian programs can be found in the Croatian-Swiss Research Program.** In this program, collaborations established before its creation receive additional points, which discourages creation of ad hoc partnerships to obtain financing and promotes merit-based collaborations established in the normal course. This program has synergies with the Horizon 2020 and UKF instruments. Preference is given to projects with high scores from the Horizon assessment, considered one of the highest quality in the EU, because (i) the process is very competitive due to high number of valuable applications, and (ii) it engages the best scientific experts in their respective fields.

### Areas for improvement

**Project selection criteria used in innovation support programs are generally too broad.** This results in a set of beneficiaries without optimal profiles for a program's goals. Programs supporting R&D projects within the S3 often have overly broad selection criteria unsuited to the intent of the S3 scheme. Some projects appear to satisfy a sectoral interpretation of S3 rather than the more sophisticated dimensions of "smart" specialization. When targeting is indicated, it refers only to a general group of potential beneficiaries, such as SMEs. No specific mechanisms are included for targeting firms within the SME population, for example, that could contribute most to the intervention's success.

**Anecdotal evidence from interviews with program managers suggested a risk-averse attitude toward project selection.** It is well known that R&D and innovation projects by their nature have inherently high uncertainty. Therefore, a systematic selection of conservatively selected projects will yield low-level average innovativeness in the system. Relatively low-risk projects are preferred over high-risk ones mostly because of the consequences related to unsuccessful enterprises, such as the requirement to return disbursed funds.

### What are global best practices? DOs and DON'Ts

**Best practice explicitly establishes project selection criteria that are coherent with policy goals and suitable for reaching the targeted population.** In addition, the selection criteria should be transparent and accessible to all potential beneficiaries. Two elements are critical in this regard. First, instruments must target the population of participants most likely to produce the policy's intended effects. Second, all potential participants must have a fair chance of entering the selection process and must receive clear feedback on the viability of their application (Cirera et al. 2020). The criteria should be coherent with and supportive of a culture of innovation where failure is not penalized but embraced as part of the discovery process.

**Policy makers and funding authorities should follow a strategy of targeting R&D subsidies to ensure they represent the best investment of public funds to increase the competitiveness of the economy.** Firms with ex ante indicators showing they would likely be innovators even if they did not receive public funds (e.g., they have innovative ideas or are academic spin-offs), are more likely to get grants. Likely to receive funding as well are start-ups with more than one owner and firms with higher capital. These indicators also suggest the firms' possible overall independent commercial success. Thus, the indicators

should be incorporated into the selection criteria to enhance targeting of companies that will bring the highest economic growth. Competition-based grant schemes, however, have the inherent risk of distorting the market through what is often referred to as “picking winners” (Cantner and Kösters 2012). “Picking winners” as a negative risk can happen when public support crowds out private investment or when public support enables enterprises to survive that cannot succeed in the market because they are inferior competitors. Project selection criteria must be fine-tuned with experience built over successive funding cycles to improve their precision in selecting the right sort of projects — those run by firms with high potential but with true gaps in financing that, if left unaddressed, would prohibit them from undertaking innovative activities.

**A good practice is to analyze selection criteria together with the selection process.**

Selection criteria and selection processes are connected in various ways. One is in promotional materials: the promotional materials for the call and the application process should clearly explain the criteria, processes, and metrics of the assessment; how the selection process works; and the availability of any appeal mechanism. Selection criteria and selection processes are also connected in terms of vulnerability to external interference. A difficult decision on transparency has to do with whether to identify the individuals involved in the selection and ultimate decision-making process. The choice creates a tradeoff between having open information and leaving decision makers vulnerable to lobbying by applicants. One approach could be to identify reviewers but anonymize their individual reviews. Each person’s specific comments should not be identified or attributed to them personally.

**To prevent external influence on financing decisions, it is advisable to ensure that the application process is fully transparent and that proposals are evaluated and selected on their technical merits.** Technical selection panels have a proven track record for the competitive selection of participants.<sup>29</sup> This approach could have the additional benefit of building networks, institutional memory, and innovation capacity. Publishing the list of awardees, a practice already well-established in Croatia, can increase confidence in the legitimacy of the selection process and results in greater transparency. The design should also include beneficiary feedback collection mechanisms to identify opportunities for improving program delivery.

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<sup>29</sup> For more details, please consult section 3.6.

**Table 3.7** Success factors in determining high quality project selection criteria

✓ **DOs**

- Design simple selection criteria and application procedures for small instruments, such as vouchers, with lower barriers to entry than those for matching grants. This is critical given the target population of noninnovative SMEs. If oversubscribed with quality proposals, use randomization or narrower but transparent selection mechanisms.
- Only include critical and relevant criteria. Bureaucratic criteria should be avoided – or directed towards eligibility criteria instead of selection criteria.
- To support cooperation among entrepreneurs, include program provisions that maximize the potential for synergy, collaboration, and peer-learning among participants of the same cohort.
- Implement effective selection criteria to identify growth-oriented enterprises.
- Design criteria to assess performance management processes to screen out no-growth tenants (in cases of BSO support).
- Announce upcoming calls to the general public with sufficient advance notice and include a clear statement of the selection criteria.

✗ **DON'Ts**

- Don't distort the competitiveness of the market by using eligibility and selection criteria with public sector preferences. The program should be kept fully oriented toward a healthy market, not toward favorite companies. Criteria should penalize applicants that show little evidence of progress other than through winning innovation grants.
- Don't allow political interference in the selection process. Evidence in some countries shows that firms whose founders have networks among policy makers are more likely to succeed in getting grants (Wang, Li, and Furman 2017).

Source: Staff elaboration.



## 3.8 Improving human resource management

### Why is this important?

**Managing innovation policy requires significant analytical capacity with flexibility and autonomy to fine-tune policies to meet changing demand and conditions.** Thus, to successfully deliver support programs, the authorities responsible for policy design and implementation must employ highly qualified personnel. Highly skilled professionals are usually difficult to recruit to government agencies if they are not offered prospects of career advancement and rewards commensurate with their qualifications.

**The professionals responsible for the successful implementation of STI policies must exercise a high level of discretion.** Innovation policy professionals often rely on their expert judgment rather than following bureaucratic rules. Management frameworks for innovation policy instruments must be designed with the role of these professionals in mind, including allowing for their exercise of judgment. This level of flexibility is not typical of many government agencies, including those in emerging economies. The challenge is much greater for countries that are catching up, because for them, design and management of innovation policies is more difficult. While overcoming disadvantages, these countries must also deal with the lack of an adequate supply of human resources qualified to perform these tasks.

**Innovation authorities must build organizational capabilities to recruit, hire, and cultivate capable staff.** An innovation authority's performance depends on a capable team with the experience and skills to work with a variety of individuals, especially entrepreneurs, investors, industry officials, and technologists. Human resource management capabilities are critical for recruiting these individuals and for mentoring and training them once hired (Aridi and Kapil 2019).

### What is not working well in Croatia?

**Croatia lacks training capacity.** In the area of innovation, both the scientific and market environments are changing so quickly that updating employees' knowledge is crucial to designing relevant support programs. Most institutions in Croatia offer broad training opportunities, but due to insufficient incentives, their use remains limited. Except for initial instruction, further training tends to be voluntary and disconnected from progress on a career path. The standard model for planning employee training is based on yearly discussions between supervisors and employees about their training needs and preferences. Requests for education are often rejected, mainly due to a lack of time because of insufficient employees to manage the high workload.

**Rewards and incentives are mostly informal and disconnected from performance.** Bonuses are handled on a one-to-one basis by direct supervisors. Decisions about bonuses and pay raises are often discretionary, with little recognition of performance in the preceding period. Career paths are short, with no prospects for promotion after a couple of years, providing few incentives for staff. Some programs, such as PoC, TTO, Eureka, Eurostars, and B-Light, use best practices; however, incentives are mostly connected to activities rather than to the effectiveness of interventions.

**Public administration regulations limit the scale of temporary contracting.** Most staff are employed under long-term agreements. Permanent staff with well-developed competencies are among the greatest assets of each institution. Nevertheless, periods of increased workload might require hiring temporary employees (for example, when payment applications from several programs accumulate). Hence, it is essential to have procedures and regulations that allow flexible contracting.

### Areas for improvement

**Despite their unique characteristics, innovation authorities in Croatia are subject to the challenges common to all public administration.** In many countries, and Croatia is no exception, public administration has difficulties establishing functional processes for hiring, retaining, training, and assessing staff (Boyne, Poole, and Jenkins 2002). Unlike private enterprises, public agencies struggle to connect promotions and results. Deeply rooted in bureaucratic traditions and counter to the “entrepreneurial” culture of private firms, agencies are unable to introduce best practices in management from the private sector into the public sphere. Even though public institutions in the innovation ecosystem have a different, more proactive set of objectives than other public administration agencies, they are nevertheless subject to the same general constraints shaping human resource management across the public sphere. One possibility could be to find more ways to acknowledge and celebrate success, create awards programs, etc. Group problem solving and staff retreats can be effective ways to build skills, teams, and frameworks for more effective management of RDI programs.

**Capacities for managing innovation policy and using ESIF must be improved.** Financing innovation is not straightforward. Many uncertainties arise, and yet people in the public service responsible for the funding must be held accountable. This situation calls for knowledgeable staff. Croatia is relatively new to ESIF financing for innovation, so much attention must be paid to training and hiring highly qualified people. The value of networking events should not be understated either. Moreover, staff should receive incentives to perform better and to achieve better results. Linking incentives to performance is one way to do this, but a proper framework (addressing financial incentives, career advancement, etc.) must be in place.

### What are global best practices? DOs and DON'Ts

**Best practice is, first, to recognize the human resource management dimension of innovation policy within government agencies and address it accordingly.** High-quality organizational management practices have been established, including minimizing red tape and having adequate processes to track performance. If the design team and the implementation team are different groups or organizations, they work closely together. Systems are designed to prevent undue or excessive external interference. Lines of authority and decision-making and approval procedures are clearly defined. All best practices in HR management are also relevant for ministerial departments engaged in the STI support ecosystem. In particular, a group of core employees working on program design should be retained and provided with broad training opportunities.

**Highly operational institutions have effective staff policies.** In the best-run institutions, human resources management addresses the definition of roles, task autonomy, entrepreneurial capacity, investment in workers' skills, the alignment of strategic and work experience values, and merit-based reward systems. Employees receive proper incentives to continuously improve their job performance. Increases in pay and other benefits are linked to individual performance, although there might be limits to incentive systems in the public sector. Opportunities for career advancement are also useful incentives. Process monitoring uses quality indicators, information, and reporting to guide potential improvements in internal processes.

**Innovation authorities need flexibility to hire staff under different models, even though this is not a popular feature in public institutions.** Best practice is to keep a relatively small but effective cadre of core staff and to hire external professionals on modifiable term contracts. Such professionals would typically be active in M&E projects. They could later be contracted to enrich the organizational culture and provide professional drive and expertise in specific areas, such as strategy and business-model development.

**Proper HR management also requires freedom to hire and retain key staff outside typical government constraints.** Agencies with independent operations insulated from normal government remuneration and recruitment practices perform better. Agencies' boards should have the regulatory ability to hire consultants for competitive remuneration. Such provisions are necessary to attract specialized program and project managers, architects and technical experts, cross-cultural professionals, legal and cyber-security experts, and M&E experts.

**Best practice designs employee compensation structures that reward good performance and create healthy competition.** Employee performance could be measured by factors such as knowledge of the job, quality and quantity of output, initiative, leadership abilities, supervision, dependability, co-operation, judgment, and versatility. Engagement metrics could also be used in performance evaluations (for example, new participants and attendance at educational sessions, webinars, etc.). Individual action plans regarding training and development needs can help ensure career growth and continued relevance of skills. The best innovation agencies also attempt to increase gender diversity, provide greater amenities, and foster cross-functional environments.

**Table 3.8** Success factors in HR management practices of innovation agencies

✓ **DOs**

- Develop mechanisms for talent acquisition. Innovation agencies (and departments responsible for innovation policies in ministries) require specialized human capital, which justifies employing candidates with profiles that exceed ability with standard administrative tasks.
- Employ consultants for dealing with specific topics and temporary staff in periods of higher workload. Ensure that appropriate regulations and procedures are in place.
- Establish clear evaluation criteria and explicit procedures for creating career development plans, with periodic training opportunities.
- Evaluate employees' performance against the performance of interventions, not only against administrative capabilities.
- Find ways to improve the attractiveness of working in the agency. Paying attention to staff development, training, rewards and recognition, can help mitigate turnover.
- Ensure that employees have enough resources of money and time to participate in valuable training and educational activities.
- Benchmark remuneration and benefits against those for similarly qualified professionals in the private sector.

✗ **DON'Ts**

- Don't leave performance evaluation to the personal discretion of direct supervisors.
- Don't follow generic HR management procedures employed in public administration agencies without specialized professional missions. Performance assessment criteria need to reflect special challenges and risks inherent in all innovation activities.
- Don't assume that the stability of work in the public sector will guarantee high staff retention.

Source: Staff elaboration.





## 3.9 Developing M&E systems and capabilities

### Why is this important?

**A robust M&E system is a precondition for gauging the effectiveness of a program.** Ultimately, this means evaluating the program's impact on the economy, not merely its administrative efficiency. Evaluation is especially crucial for innovation policy instruments because innovation processes are complex and uncertain. Information obtained via an M&E system becomes the basis for adapting programs along the way, creating a dynamic feedback loop from design to implementation to evaluation and back to design. Use of M&E frameworks and, more importantly, the design of impact evaluations from the beginning of the program, are still rare practices in many developed and developing countries, however (Teirlinck et al. 2013).

**Using a solid evaluation with a high-quality M&E framework, information can be collected that will help determine whether a program is effective, and should be continued and improved, or ineffective, and should be discontinued.** Policy managers can also use robust evidence when negotiating with funding agencies for ongoing support. This is particularly important in Croatia because most innovation funding comes from the European Union.

**Evaluations may be conducted for two distinct albeit related purposes: improving the current or future program and legitimizing its continued existence.** Broad consensus exists on the importance of monitoring and evaluation of policy in general. Evaluations may serve the purpose of learning to improve current or future versions of the program. They may also legitimize political decisions to continue investing in a program. An M&E framework provides information about the effectiveness of interventions, supplying general public data on the use of public money (a vehicle of accountability for implementing agencies). Thus, outputs of the M&E system contribute to the legitimacy of decisions regarding whether to continue a given program.

**Monitoring and evaluation are not the same.** They work together, but each has its own role. Monitoring focuses on documenting activities and outputs to track trends and milestones during the life of the program. Evaluation, by contrast, is performed (i) to learn from implementation and inform the redesign of current programs or the design of future programs, and (ii) to satisfy public accountability needs by demonstrating the effects of policy investments.

### What is not working well in Croatia?

**M&E systems focus on meeting bureaucratic requirements.** The primary focus of the current M&E systems of programs analyzed in this report is accountability to the MA and the European Union (i.e., the fulfillment of bureaucratic requirements). Little consideration is given to learning and adjusting current or future programs. All programs have a basic set of indicators that usually track outputs. Information for high-level outcome indicators is rarely collected and analyzed, however. Post-closure data collection to monitor long-term

outputs and outcomes is also rare. Moreover, not one of the reviewed programs incorporated counterfactual evaluation at the design stage. If planned, an impact evaluation is envisaged at the level of priority axis within OPCC or set of programs (e.g., Integrated Territorial Investments), rather than for each program.

**Greater investment in M&E capabilities is necessary across the government innovation policy system.** In many cases, managers create ad hoc tracking systems using in-house spreadsheets to gather information for their own decision making. Thus, monitoring systems are often highly fragmented and based on nonstandard information categories that cannot be compared across programs. By contrast, the model approach to monitoring is based on a dedicated IT system and unified procedures integrated at least across all departments of a single institution.

Some observations from the analysis of policy instruments affected by the above issues include:

- Programs with the biggest gaps in M&E system design are local versions of pan-European instruments. In these cases, information collection is limited to what is required for regulatory compliance. No follow-up contact is made with beneficiaries after project completion. Moreover, M&E implementation does not include impact assessments for almost all programs.
- Best performers in M&E include the STP2-financed programs, such as PoC and UKF. STP2 included impact evaluation analysis, which is very rare. Research Projects, Installation, and BSO have solid M&E in place. These programs collect a broader scope of information and include data relevant for learning that can lead to improvements in subsequent editions.

## Areas for improvement

**Evaluations can be leveraged in institutionalized learning processes.** Without formal efforts to understand the evidence generated from evaluations, the findings cannot be used to improve programs and adapt them to changing conditions. Over time, if these processes are in place, they can create a culture of evidence-based innovation policies. Due to the relatively short history of the STI support ecosystem in Croatia, however, such an evaluation culture has not yet developed. Nonetheless, certain Croatian authorities have shown good awareness of the need for robust impact evaluation. As a result, as part of the evaluation of the Croatian S3, the World Bank will assist the government in conducting impact evaluations for a number of innovation support programs.

**Government capabilities for execution and use of impact evaluations need strengthening.** Policy makers often do not recognize the value of evaluation results. Even when they are available, they are often underutilized in decision making. Implementing impact evaluations requires specialized knowledge and significant experience. M&E, in general, requires appropriate incentives and specialized units to distill the findings and integrate what is learned into policy design. In addition, M&E has a cost, and the benefits are not observed immediately, so resources to do it well are not provided. This happens around the world, not only in Croatia. When M&E is practiced, it is often in response to EU regulatory requirements.

## What are global best practices? DOs and DON'Ts

**M&E system design should align seamlessly with program features.** Such alignment minimizes overhead and interference with other aspects of program management. Ideally built into routine management processes, M&E continuously gathers relevant information and produces appropriate summaries for operation management. M&E design should be oriented toward continuous improvement at all levels of the program. In outfits that manage several related programs, the monitoring system should be a shared resource across common operations with the capability to produce reliable program-specific reporting. Categories of data, periodicity, templates, and similar components are typical in well-designed monitoring systems. Applicants should be made aware of expectations regarding M&E data collection and reporting, and this should be clearly communicated in the call.

**A well-designed and implemented monitoring system builds toward policy evaluation needs.** Evaluations may be conducted at several levels and periods. The first sets a baseline for future comparison with the results of ex post evaluations. This is often directly connected to proper diagnosis of the problem the instrument addresses. Intermediate analyses of context or beneficiaries' changing circumstances, for example, may be necessary to properly interpret the results of later evaluations.

**Evaluation designs will differ depending on their purpose.** Evaluations to legitimize investments generally require the participation of external evaluators to balance the expected vested interests of the managers in continuing their prior work. Program managers themselves undertake evaluations to improve their programs, so they must possess the particular capabilities and resources required. The learning function of an evaluation also feeds into its role in legitimizing funding decisions and is essential for the usefulness and success of those decisions. Often during program implementation, the situation is dynamic and may change over time. Therefore, evaluation aimed at fine-tuning the combination of policies is critical for the policies' effectiveness.

**A well-designed M&E framework involves appropriate indicators.** Having appropriate indicators facilitates using evaluation results for progressive learning and to improve future policy design. Furthermore, legitimizing the implementation of future versions of the same program depends heavily on having an M&E framework in the design phase because the quality of information on a program's impact depends on the quality of the data collection system and the set of indicators determined at the design stage. M&E activities conducted ad hoc during the implementation stage, without a previously thought-out strategy, produce low-quality data that cannot support a legitimate justification for decisions about continuing the program. Evaluating impact is especially important in cases where the program starts as a pilot (Gambi 2012).

**External and internal evaluations are necessary for accountability and learning.** Evaluation results should inform improvements and future policy design. Clear guidelines and plans for evaluation must be established during the initial design period. Evaluations of specific programs generally combine different methods to evaluate their effectiveness, including quantitative and qualitative measures. Certain limitations should be considered when selecting the appropriate evaluation methodologies.

**Evaluation research findings are very sensitive to the methods and data they require.** For example, a review of earlier literature found that reports using macro-level data tended to be more positive about input additionality (increasing the whole amount of investments, not just substituting private financing) than are studies based on lower-level data (e.g., information on employment or revenues of individual firms) (David, Hall, and Toole 2000). Another limitation of the evidence lies in excessive use of self-reported data, which is typically biased toward supporting the continuation of schemes. Program-specific evaluations in other countries have mostly focused on straightforward outcome measures, such as gross value added (GVA) and employment. These are important outcomes, but the methods may not show how the programs are responsible for them.

**Monitoring and evaluation can be complex processes.** In some programs, it is challenging to establish a control group, making quasi-experimental evaluation nearly impossible. It is also difficult to determine which elements of the programs worked because interventions tend to be dynamic and integrated, with a blend of programs, such as advisory services and funding support, received by a single beneficiary (Tsamis 2019). For example, clusters can be highly complex, given that they often involve a wide diversity of motivations, rationales, activities, outputs, outcomes, and associated effects. As a result, innovation policies acting through clusters are also highly diverse, making evaluating their effectiveness very challenging (Maffioli, Stucchi, and Pietrobelli 2016). Unlike evaluations of direct financial programs such as vouchers and grants, evaluations of cluster policies or technological parks do not sufficiently address input additionality.

**The usefulness and reliability of evaluation are greater if firm-level administrative or statistical data support the conclusions.** Particular attention should be given to the selection of relevant indicators, for both monitoring and evaluation. If the M&E system uses generic key performance indicators (KPIs) that are unrelated to the logic of the program, a risk arises that an observed change will be produced either by factors other than the intervention itself or through an economic mechanism unknown to the managing institution. Finally, monitoring, evaluation, and learning require significant capabilities from policy managers to properly design M&E systems and adequate processes to collect the right information without overburdening recipients during the project. Processes should also enable continued information gathering after the projects are complete.

**Proper design and execution of an M&E framework require high-quality analytical capacities.** It is possible to complement internal capacity with expertise outside the organization running the programs. Methodologies for assessing the impact of interventions are complex, and their implementation requires specialized expertise generally held only by professionals with PhD degrees. A full cadre of these specialists would be costly to employ in-house. Doing so may not be necessary, however, due to the periodicity of full-blown evaluations. Nevertheless, a core team of qualified employees is essential for commissioning research and interpreting its results. Such a team engaged in M&E on the agency side must consist of highly skilled people to gather information from all stakeholders in the Croatian innovation ecosystem. These specialists could be organized into a separate governmental agency, rather than employed by individual institutions, as recommended in the report on the earlier stage of the Croatia PER project (World Bank 2019).

**Table 3.9** Success factors in designing M&E systems

✓ **DOs**

- Follow the CART<sup>30</sup> framework when designing an M&E system.
- Design the main principles of an evaluation strategy related to a program before starting implementation (Olejniczak, Raimondo, and Kupiec 2016).
- Track indicators resulting from the logic of the program.
- Use appropriate statistical methods for evaluation that respond to the mechanics of the program (proper specifications of quasi-experimental designs).
- Conduct systematic data collection to enable policy evaluation, learning, and improvement.
- Introduce learning from the M&E system to improve programs.
- Use random audits to monitor programs while reducing control burdens for low-risk beneficiaries.
- Commission program evaluations from external, competent, independent private or nonprofit institutions.
- Make evaluation results and documentation public.
- Connect the M&E system with learning and adjustment to the system.

✗ **DON'Ts**

- Don't evaluate the impact of programs based only on beneficiaries' surveys or fulfillment of administrative performance (e.g., the number of supported projects or the value of disbursed financing) or generic economic indicators (such as GVA or employment).
- Don't make data collection overly burdensome for beneficiaries; it will reduce program efficiency and could disincentivize potential applicants.
- Don't reduce the M&E system to fulfilling a donor's regulatory requirements.
- Don't rely only on surveys of beneficiaries' self-reported information. Use administrative data as much as possible (e.g., information from tax returns, statistical data, etc.).

Source: Staff elaboration.

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**30** The CART framework stipulates the following principles for data collection and monitoring: (i) Credible: collect high-quality data and analyze the data accurately; (ii) Actionable: commit to act on the data you collect; (iii) Responsible: ensure the benefits of data collection outweigh the costs; (iv) Transportable: collect data that are comparable across evaluations.

**Innovation authorities could benefit from existing external capacity on M&E by establishing and cultivating a community of practice.** A community of practice consists of professionals who share a concern for and expertise in innovation support and who learn how to do it better as they interact regularly. This approach reflects the social nature of human learning. Innovation agencies across the world engage long term with groups of innovation support experts to obtain constant feedback on their activities and insights into the scientific literature on innovation. Cooperation with the community occurs during regular workshops and conferences or commissioned advisory projects (e.g., to support the justification of programs during the design process). Proper design and implementation of M&E systems require such support from external experts for two reasons. First, proper impact evaluation requires advanced econometric skills, which employees of innovation agencies do not have. Second, no program should judge its own case: M&E systems are dependent on external contributors to ensure their objectivity. An example of best practice is a community of M&E practice developed by the Polish Agency for Enterprise Development (PARP). PARP regularly organizes workshops that bring innovation professionals together, gives them a theme, and engages them in various activities. PARP also sends key staff to scientific and professional conferences, both in Poland and abroad, to maintain contact with the community.

## 3.10 Optimizing reporting and auditing



### Why is this important?

**Funding programs for SMEs work effectively only if the scale of the intervention and the critical mass generated by these programs are sufficient to make a difference in the economy.** Firms should perceive participation in the support scheme as profitable. Achieving this objective requires that the government have a high capacity for interacting with a large population of firms in the country. It is critically important, therefore, to ensure that clear regulations apply to public support for firms and that institutional capacity with full understanding of business operations exists to engage with them.

**Beneficiaries of public support should not have to bear a greater compliance burden than commercial regulations already require.** In most developed nations, the need to encourage small and medium enterprises (SMEs) to participate in government programs, either as recipients of funding programs or as government suppliers, has led to engagement rules similar to those that firms must adhere to in normal commercial market operations. Researchers have even less experience with, and fewer skills and resources for, meeting the burden of complying with reporting and auditing regulations. Programs targeting scientific R&D should therefore keep the bureaucratic burden at a lower level than that demanded from SMEs.

**Burdensome reporting requirements reduce the attractiveness of support instruments.** The burden on beneficiaries related to monitoring project implementation should be as low as possible. If costs associated with frequent — and in some cases pointless — reporting obligations are higher than the benefits, potential applicants will lose interest in applying for support. In some EU countries, costs of preparing project applications and of the reporting

and monitoring subsequently required are so high that firms in the target group with high-quality business ideas (especially large firms that qualify for lower cofinancing levels) decide not to participate in public support schemes (World Bank 2020). Private enterprises already encounter numerous administrative requirements in their day-to-day business.

**Government agencies dealing with SMEs and researchers should aim to decrease the compliance burden in two main areas: regulation and administration.** First, it is necessary to rewrite the rules under which SMEs become beneficiaries of government funding programs so that they face similar or lower burdens than they already do in normal commercial operations. Use of contracts and adjudication mechanisms similar to those firms find in the market is a good practice. Second, government agencies must have personnel sufficiently familiar with SMEs' culture and operational processes to interact with them with minimal cultural dissonance.

**Proportional and clear auditing procedures also reduce the effort required to meet the obligations of public support recipients.** In many countries, control institutions rely on frequent financial audits and sanctions — rather than on the provision of information and advice — as the main enforcement measures. The latter is a more constructive approach to noncompliance. Complying with the excessive requirements of control institutions takes time and resources, discouraging potential beneficiaries from applying. In high-performing innovation ecosystems, auditors focus on substantive progress in project implementation rather than purely on financial matters, and they use persuasion as a basis for operation. In addition, selection of entities for audit is guided by a risk-based approach that more frequently audits entities with previously detected violations. This is often supplemented with audits of a random selection of a smaller number of beneficiaries. Reform of auditing procedures would provide gains for all stakeholders. Beneficiaries would appreciate a reduced burden and greater predictability, while public authorities would achieve improved compliance and enforcement of regulations using fewer resources.

### What is not working well in Croatia?

**Innovation authorities employ an approach to monitoring beneficiaries similar to the accountability rules for public institutions.** Auditing and reporting procedures call for processes that firms and researchers generally do not engage in during ordinary business operations. Thus, participation in public support schemes is associated with the need to make significant additional efforts beyond the core activities of beneficiaries, which weighs heavily on the functionality of the instruments.

**Programs financed from the state budget have significantly lighter administrative burdens than instruments cofinanced from European funds.** Over the years, Croatian authorities have acquired institutional knowledge related to management of instruments financed locally (with national budget or World Bank lending). The authorities have introduced numerous simplifications and gradually adapted regulations to ease implementation. ESIF cofinanced instruments are relatively new in the Croatian innovation ecosystem, however, and are subject to significantly more stringent requirements. Certain good practices can be found in Proof of Concept (e.g., expenses are verified only once, following project completion) and UKF (progress reports are submitted only once per year and are relatively narrow in scope).

## Areas for improvement

**European audit procedures are rigorous and impose excessive obligations for expenditure control.** The rigid approach of European audit authorities also contributes to reporting pressure on beneficiaries. These factors, combined with the learning curve associated with implementation of EU funds (2014–2020 is the first period during which Croatia fully implemented EU funds), lead certain authorities to focus on minimizing noncompliance with regulations at all costs. Such an approach translates into a high reporting burden for beneficiaries of EU cofinanced instruments.

## Stories from beneficiaries

### Eliminating burdensome procedures through communication



**The move to abolish timesheets provides a good example of reducing reporting burdens during project implementation.** Some programs required beneficiaries to submit daily timesheets every quarter and, in some cases, every month. This was particularly onerous for projects with more than 100 people working on implementation. The rule, probably introduced due to fear of irregularities or to be on a safe side, was a relic from former Framework Programmes (2007–13).<sup>31</sup> The institutions in charge of managing programs eventually abolished the timesheet requirement.

## Takeaways

- Improvements can be achieved when professional program managers are given the space to accommodate beneficiaries' feedback.

**Innovation authorities should strengthen their capacities with relevant scientific and technical knowledge, advancing toward more sophisticated forms of project monitoring.** Reducing the dependence on financial auditing requires that IBs have strong institutional capacities. For example, technical experts could follow project developments from a scientific or technical perspective, identifying potential irregularities to IBs, while providing beneficiaries with ongoing advice. If a funding agency is not able to employ highly qualified project supervisors, it may rely too much on screening for cost eligibility. In addition, advice rather than ex post auditing reduces noncompliance and increases the chances of project success.

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<sup>31</sup> The EC dropped this requirement as it was deemed to be an excessive burden on projects.



## What are global best practices? DOs and DON'Ts

**Identifying eligible expenditures and auditing or assessing compliance is a complex, expensive task and requires specialized skills that can be difficult for the government to acquire.** This raises the potential for fraud, such as relabeling and overestimating what constitute expenditures in R&D (Cirera et al. 2020). Ensuring proper spending of public funds is necessary. A successful approach to simplification, however, particularly for small firms, has been to switch from a project-based to an entitlement-based system.

**In an entitlement-based system, eligibility of the firm's R&D activities is presumed ex ante.** Applicants self-report that they are eligible, and the implementing agency conducts ex post audits to verify that. This approach leads to approvals for SMEs' expenditure plans prior to their realization, reversing the current approach in which each expense item must be reported when incurred. Since the entitlement-based system for ensuring compliance of eligible expenditures differs from the system used in government agencies, the agencies disbursing public support will require new competencies to implement it.

**In the context of ESIF, an entitlement-based system for verification of allowable expenditures might require modification of current European regulations.** The transition between financial perspectives currently taking place provides an opportunity to introduce the relevant provisions in the EU and national legislatures (e.g., Common National Rules). Allowing the possibility of verifying a random subset of expenditures rather than all items would create the possibility of significantly reducing the administrative burden on beneficiaries.

**Policy makers should also promote voluntary compliance tools to simplify the application and verification processes.** Complex restrictions and rules have increased uncertainty about which activities proposed by firms as R&D-eligible expenditures might be disallowed by IBs. This tends to reduce participation. In Denmark, the issue has been addressed by introducing a voluntary compliance verification process. In this procedure, beneficiaries can consult public authorities on the eligibility of specific expenditures. The opinion provided by the agency is legally binding; this lowers the cost for firms and reduces uncertainty, leading to an increased rate of compliance (Aridi and Kapil 2019).

**Monitoring and reporting procedures should follow the responsibility principle in the CART approach to M&E** (Batcheck et al. 2016). This principle states that program managers must be sure that the benefits of data collection outweigh the costs. In the case of reporting obligations, this means that the burden on beneficiaries should not exceed the potential savings from detection of unallowable expenditures. Maintaining the right balance in reporting will not only ensure proper implementation of the intervention but also make the program more credible in the eyes of potential applicants.

**Table 3.10** Success factors in the area of reporting and auditing

### ✓ DOs

- Simplify reporting obligations for beneficiaries while maintaining data collection that allows sound assessment of project performance.
- Increase flexibility by establishing a transparent procedure for changing financial plans when the situation justifies it.
- Review information obligations on a regular basis. Provide beneficiaries with guidance on reporting.
- Conduct systematic data collection to enable monitoring of project cost patterns to understand typical eligibility problems across projects.
- Keep criteria stable for periods of at least five years or more.
- Establish a voluntary compliance verification process that allows firms to preapprove expenditure categorization to reduce uncertainty.
- In the case of instruments of smaller value, such as vouchers, employ random auditing checks to monitor compliance rather than a full audit of beneficiary activities.
- Implement surprise random audits for any beneficiary of support programs. This will provide incentives for beneficiaries to maintain project compliance with regulations, without the need for constant preparation of documents, authorizations, etc.
- Minimize the bureaucratic burden for applicants by simplifying the reporting obligations and shortening the time needed for approval of eligible expenses.
- Follow the development of projects with agency project managers with scientific or technical knowledge and audit if their insights into the project encounter red lights.
- Invest in compliance and audit capabilities in innovation support agencies, given that maintaining integrity and inhibiting abuse is vital.
- Connect audits of numerous projects undertaken by the same beneficiary. Apply a risk-based approach to auditing.

### ✗ DON'Ts

- Don't require a rigid 100 percent correspondence between the amount and scope of expenses incurred in R&D projects and planned expenses described in the application.
- Don't frequently change compliance criteria (such as eligible expenditures and exemption characteristics) because R&D investment decisions need predictability over time.
- Don't create compliance uncertainty for prospective participants.
- Don't rely only on financial auditing as a way of ensuring compliance with regulations.
- Don't audit the whole firm if only one project is the selected target, since it would severely disrupt the firm's activities.



## 3.11 Enhancing interinstitutional coordination

### Why is this important?

**Coordination across several institutions is imperative when it comes to policies related to the innovation ecosystem.** These include complementary components such as human capital development, R&D, technology, entrepreneurship, product development, export, and investment promotion policies. In addition, innovation policy management requires a flexibility and rapid adaptation to changing trends that other policies do not require. Consensus in the area of innovation policy holds that policy design and management should be adjusted to the intended area and that rules of accountability should be adjusted so as not to interfere with policy viability.

**The effectiveness of innovation policy is highly dependent on having the right institutional arrangement of government agencies in the innovation ecosystem.** No single arrangement fits all contexts. Known priorities for innovation policies, however, relate to timing (technologies and technology markets are “fast clock” systems), changes in target beneficiary populations, and changing forms of support (as business needs evolve), among other things. Therefore, institutions designed to govern innovation policy should have the capacity and the discretion to design and manage support instruments that meet these changing demands.

**Interaction between innovation authorities may lead to either mutual undermining or fruitful cooperation.** Fruitful cooperation may happen under the umbrella of formal or informal arrangements and may involve direct or indirect joint efforts. Best practice in this case requires awareness of the interaction and measures that can ensure cooperation when interaction is an inevitable part of the governance structure.

### What is not working well in Croatia?

**The division of labor among ministries and agencies charged with designing and implementing innovation policies in Croatia creates very difficult coordination problems.** Many small-scale and routine decisions that are part of managing the instruments require interagency consultations fraught with differences of interpretation of the rules and cultural differences between agencies and ministries; these can lead to contrasting views on the importance of instrument components, among other things. These consultations often rely on personal relationships among staff and understandings cultivated by management. The institutional setup of the Croatian STI ecosystem is influenced mostly by the institutional framework required for implementing the ESIF as defined by the government, not from analysis of the needs and capabilities of local agencies and other stakeholders.

**The fragmentation of responsibilities across agencies and ministries contributes to significant delays in resolving routine consultations and implementing the instruments themselves.** These delays are almost universal across instruments in the system. They undermine potential beneficiaries’ trust in the authorities’ competency and reduce the

incentive to participate in their programs. The effect on the policies' potential for success cannot be underestimated. Interviewees report that fragmentation results from initial efforts to ensure compliance with the ESIF regulations.

**The excessive fragmentation of responsibilities among Croatian authorities could be considered “gold-plating.”** Gold-plating refers to a Member State's tendency to impose additional requirements or obligations that go beyond the requirements foreseen in the transposed EU legislation. Croatia's distribution of responsibilities in STI support programs across at least three institutional levels (MA/IB1/IB2) could be reconsidered in the upcoming financing cycle, especially since examples are available of successful programs designed and implemented by a single authority. The institutional design of the three-level institutional system, including two ministries and two agencies in implementing one thematic objective (TO1) of the Operational Program, impacts the functionality of the STI system. This resulted from a political decision to allocate significant investment funds and decision power to more than one state administrative entity. The division of work led to coordination difficulties due to different implementation processes and different roles for the various instruments' implementing bodies.

## Areas for improvement

**Croatia's organizational setup for innovation support does not necessarily stem from EU guidance and can be optimized.** EU rules oblige Member States to organize a management and disbursement system based on a particular division of responsibilities.<sup>32</sup> Generally, each operational program must be negotiated and overseen by a management authority (Article 72 and 123-124), put into action by an implementing authority (Article 72 and 124 CPR), and audited by a certified institution (Article 72). The Common Provisions Regulation specifies the responsibilities of each type of institution but does not impose a specific organizational arrangement. Croatia seems to have gone a few steps further, overregulating and prescribing many elements of the ESIF national management system. Multiple institutions with very different experiences and capacities are involved, making coordination and implementation extremely challenging.

**Copying and pasting solutions from other European countries could be a problem.** The belief seems to be widespread that replicating successful institutional blueprints for innovation policy from one country will create similar results in Croatia. Policy makers are rightly attracted to the idea of looking outside their own jurisdiction for new approaches and solutions to their problems. It is essential, however, to understand and adapt solutions to the local context, which is not always straightforward.

**Institutional capacities must be strengthened.** Implementing innovation policies requires building capabilities in the public sector and allocating enough resources — financial and human — to effectively design and implement those policies. The Croatian innovation ecosystem was deeply shaken by institutional rearrangement during the advent of ESIF, which may explain its insufficient capabilities to establish an optimal institutional setup. Moreover, the volume of ESIF available for STI was disproportionately high compared to

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<sup>32</sup> Regulation (EU) No. 1303/2013, *Common Provisions Regulation* (CPR).

the state budget funds, and this created institutional changes and political influence in institutional design not motivated by the functionality of the innovation ecosystem.

### **What are global best practices? DOs and DON'Ts**

**The breadth of institutional arrangements for innovation policy span well beyond innovation agencies.** When looking at institutional functions along the stages of the policy life cycle, at least four sequential but iterative steps can be distinguished: (1) formulating innovation strategies (long-term policy aspirations); (2) designing innovation policies; (3) implementing and supervising innovation policy; and (4) deploying innovation instruments and innovation activities (Angelelli, Lun, and Suaznabar 2017). The crosscutting and nonsequential functions of coordination and planning should also be added, given their importance in the context of innovation policy.

**Desirable institutional arrangements are dependent on context.** No agreement has been reached on the ideal institutional arrangements for effectively advancing innovation policy; successful examples have proven to be idiosyncratic and context specific. An emerging consensus posits that no single model for an ideal innovation agency exists (Reid and Glennie 2019). Institutional arrangements that work for one country may not be transferable to others (Aridi and Kapil 2019). The important questions in setting up institutional arrangements in each country are what role innovation agencies should play and how these roles can best respond to the contextual challenges the country faces.

**What matters for policy implementation capability is not “form” but “function.”** Separating design and coordination from implementation has some advantages, especially given that some implementing agencies may have more flexibility and leverage to hire talent, offer competitive wages, and use a less bureaucratic and more agile approach than line ministries (Andrews, Pritchett, and Woolcock 2017). An implementing agency may also have a specific area of focus (such as digital innovation or biotechnology), requiring subject-specific knowledge (although this also happens in more generic agencies), and may be more mission-oriented. This insight calls into question the past merger of HAMAG and BICRO, which implemented support programs with fundamentally different objectives.

**Effective coordination across innovation institutions is needed to maximize the combined impact of multiple efforts and instruments.** Central ministries (as opposed to line ministries) should help ensure the strategic relevance of innovation policy in the wider context of economic prioritization and the effective use of public funds for innovation. The key success factor in interinstitutional cooperation is the existence of formal communication mechanisms. For example, participation in steering committees of representatives from institutions not directly engaged in a program’s management could contribute to dissemination of knowledge about actions undertaken across the innovation spectrum.

**Innovation policy making in most countries is very fragmented.** As a result, some countries have opted to establish innovation councils that coordinate the innovation policies of all line ministries. This can be useful in bringing the different actors together in the design stage, but it does not necessarily ensure the coordination needed to implement innovation policies, which requires a de facto alignment of all ministries’ policies. The recently

established Croatian Innovation Council has the potential to bridge the gap between the institutions of the innovation ecosystem and to enhance communication and coordination.

**Strong formal coordination mechanisms are necessary to advance innovation policies under several institutions and to ensure policy coherence in the National Innovation System.** These formal coordination arrangements are usually under the direction of a high-level steering committee. At the very least, basic coordination would ensure minimum overlap in the scope of programs across the various agencies. In addition, effective coordination can exploit potential complementarities and synergies across programs. For example, agencies might gravitate to a natural specialization driven by goals, target beneficiaries, or other criteria. Relative specialization across agencies can offer a holistic system of support for innovation policy.

**A more ambitious coordination effort would go beyond avoiding duplication and exploiting complementarities among agencies to include combined strategic planning, goal setting, regular monitoring, and evaluation.** More sophisticated coordination can exploit benefits from experimentation and learning from the results of program implementation by any single agency and ensure wide dissemination of best policy practices across implementers (Cirera et al. 2020). Other advanced coordination exercises may involve not only horizontal but also vertical coordination to include regional institutions and international bodies. Moreover, coordination could be used to negotiate a common interpretation of the rules governing instrument implementation to avoid bottlenecks.

**A necessary condition — although not a sufficient one — for ensuring coordination is to have an overarching innovation policy strategy.** Such a strategy must include clearly stated objectives, targets, and indicators that can be monitored. Without this document, it is difficult to bring line ministries and agencies together under a common set of policies. The institutional structure should result directly from assumptions and objectives envisaged in strategic documents.

**Table 3.11** Success factors in institutional design for innovation policy

✓ **DOs**

- Explicitly analyze forms of interaction between government institutions related to innovation and design measures to ensure successful cooperation among them.
- Ensure political commitment to developing national quality infrastructure and to adopting standards with appropriate institutional mandates and resources.
- Review the effects of new rules on each institution, together with their functions and capabilities, before each new MFF.
- Ensure the operational ability of Croatia's newly established innovation council. Broaden its composition with representatives from the private sector and research institutions.
- Establish formal communication procedures between government entities. Avoid leaving communication to the informal personal connections of agency employees.

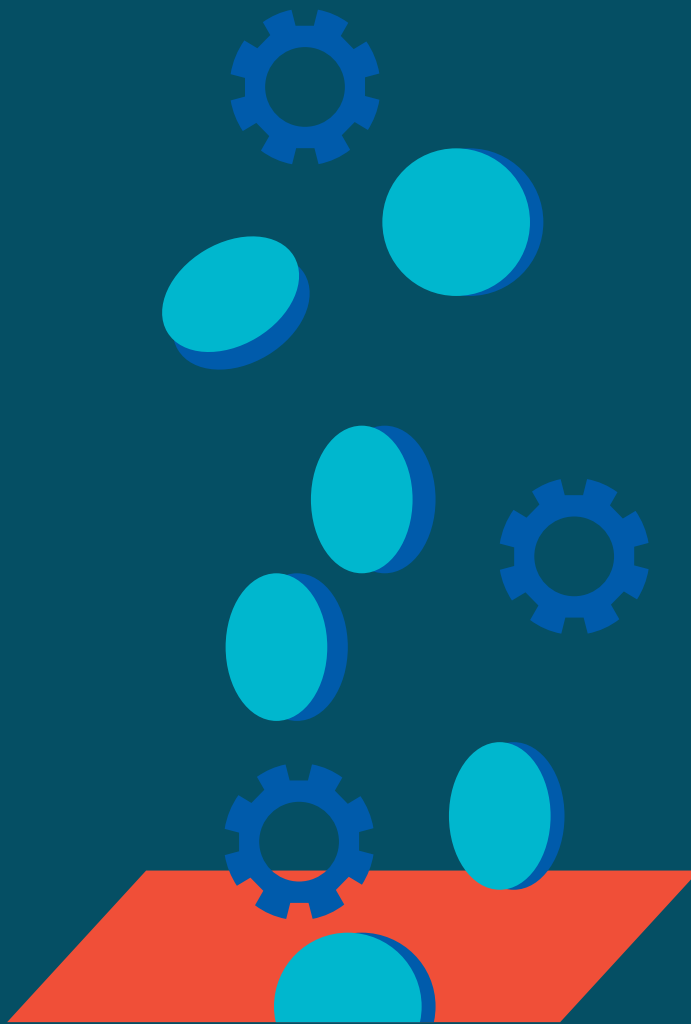
✗ **DON'Ts**

- Don't establish too many institutions. Prevent policy fragmentation to avoid conflicts of interest and excessive administrative costs in the system.
- Don't leave communication and coordination between institutions to the discretion of employees. Introduce formal processes to ensure exchange of knowledge between various agencies.

Source: Staff elaboration.

# 4

## Special Considerations for ESIF Implementation







# Special Considerations for ESIF Implementation<sup>33</sup>

- Process maps developed for selected ESIF programs suggest that the application and selection processes are highly complex and inflexible, from the point of view of both beneficiaries and institutions.
- The processes used in ERDF-funded programs are mostly governed by national rules, which have scope for improvement and simplification.
- Beyond the set national rules, institutions should introduce practices to increase the speed of commitment and disbursement of funds, including better access to practical information for applicants, more project preparation support, and more frequent organization of calls.
- To reduce the administrative burden imposed by ESIF implementation requirements, systemic changes — including ensuring the right human capacities, optimizing the institutional setup, engaging stakeholders, and allowing more flexibility in the regulation — are needed.

**This section explores in detail the processes involved in ESIF-funded programs to provide targeted recommendations for the next programming period.** ESIF funds are the largest source of STI funding in Croatia, making up around 90 percent of project-based financing in the 2014-2020 period (World Bank 2019). In addition to the importance of ESIF funds for the STI policy mix, Croatia has an opportunity to learn and adjust its approach before the onset of the next funding period (2021-2027). Therefore, this section focuses on the way ESIF funds are administered in Croatia to find ways to improve their effectiveness and absorption. First, a process diagnostic using process maps is presented that will identify common issues in several representative ESIF-funded programs. Next, a review of the national rules relevant to process design will identify bottlenecks and areas for simplification and improvement. The section concludes with practical guidance for finding ways, beyond regulation, for improving commitment and disbursement of ESIF funds.

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**33** The analysis in this chapter is based on OPCC 2014–2020, from the perspective of Thematic Objective (TO) TO1 and TO3. The findings are therefore most accurate for ERDF and Cohesion Fund (CF) financing, although some of the outlined principles may also be relevant to and useful for other ESIF financing.

## 4.1 Process diagnostic

**Process maps have been developed to illustrate how regulations affect the application and selection process from the beneficiaries' perspective.** Process maps allow visualization of all steps in the application and selection process, as well as the background and supporting documentation applicants need to participate in a call for proposals. Maps identify the roles and responsibilities of institutions at every step of the process. This approach has been used extensively in different contexts; for example, maps can help showcase a business registration process. Given the complexity and administration processes involved in conducting a call for proposals, this technique illustrates bottlenecks in the process and administrative burden already in place.

**Process maps were developed for four representative RDI support programs:** SIIF, STRIP, IRI, and PoC<sup>34</sup>. Developing process maps is a labor-intensive exercise requiring a high degree of selectivity. SIIF, STRIP, and IRI were selected as arguably the most representative RDI project financing programs in MSE and MEEC in terms of activities funded and program continuity. In addition, PoC, a program funded from the national budget<sup>35</sup>, was included to examine the key differences as compared to the three other programs, all funded from ESIF. The process maps are presented in figures 4.1, 4.2, 4.3, and 4.4, and a detailed process description appears in Appendix V. The following sections include findings mostly relevant for ESIF-funded programs, along with some findings relevant to PoC, for which the structure differs greatly.

### Call modality

**All programs had open calls, but three were temporary and one was permanent, which may impact the quality of the selected projects.** SIIF, STRIP, and PoC were temporary open calls, meaning that a deadline for submission of project proposals was set, after which the award procedure began. This approach allows submitted project proposals to be ranked and, in theory, ensures that higher-quality projects receive funding, provided that calls are published on a regular basis.<sup>36</sup> Contrary to this, IRI was a permanently open call, presenting some disadvantages regarding project proposal selection.<sup>37</sup> Applicants are assessed on a “first-come, first-served” basis. To be funded, projects are expected to reach a threshold of minimum points in the quality assessment; projects do not receive comparative rankings. This approach may not necessarily reward better projects and could give implicit advantage to applicants that apply earlier than others, due to the limited funds available. Because applications are processed until the budget is depleted,

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- 34 Process maps were developed for SIIF and STRIP based on one call in the 2014–2020 programming period, the first IRI call in the 2014–2020 programming period, and the sixth edition of PoC. PoC had eight calls, seven financed through STP2 and one from the national budget. The sixth edition of PoC was selected because it was the last edition that supported both public and private beneficiaries.
- 35 PoC was one of the subfinancing programs under STP2. It provided support to firms (so-called private PoC) and researchers (so-called public PoC). Once the STP2 funding for PoC was exhausted, PoC private was picked up in one round from the national budget.
- 36 When only one call takes place, there is only one time-limited opportunity for funding. Good-quality projects may emerge after that one call has been closed.
- 37 The process elaborated in this section refers to the first IRI call launched in May 2016.

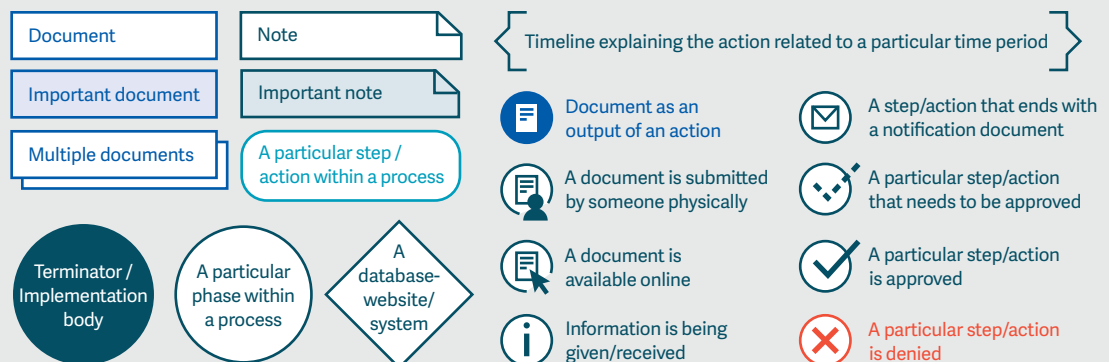
lower-quality projects submitted earlier in the period may end up receiving funding while better projects submitted later must be rejected.

## Program preparation

**Preparing support schemes that may include private-public collaboration is complex and has been challenging.** The STRIP call for proposals had issues with lack of clarity and ambiguity in the methods of applying EU state aid rules that had to be taken into account during program preparation due to the involvement of private sector partners. The preparation process was also made more complex by the back-and-forth between different bodies within the system. It took six months to prepare the call after the State Aid Program, the legal basis for launching the call, was developed. During the application period, five amendments were made in the Guidelines for Applicants, and several hundred questions and answers followed publication of the call for proposals.<sup>38</sup> For IRI, preparing the call for proposals was also a lengthy process, again because a State Aid Program had to be developed and various institutions with different roles were involved. It took more than a year to create the documentation that served as the legal basis for publishing the IRI call for proposals. It was subsequently amended six times, and over 800 questions were submitted by potential applicants, possibly indicating that beneficiaries lacked clarity and full understanding of the call's elements, including state aid calculations. The state aid element has been challenging for both STRIP and IRI, especially when a project proposal combines different R&D activities with different aid intensity (e.g., applied research, experimental development, and technology transfer). Determining the amount of state aid in such cases is a complex task, both for program managers and for applicants that must assess and calculate the intensity of grants in advance.

<sup>38</sup> One issue is that Q&As cannot refer to specific applications; however, the guidance provided should be as specific as possible.

### PROCESS MAP LEGEND



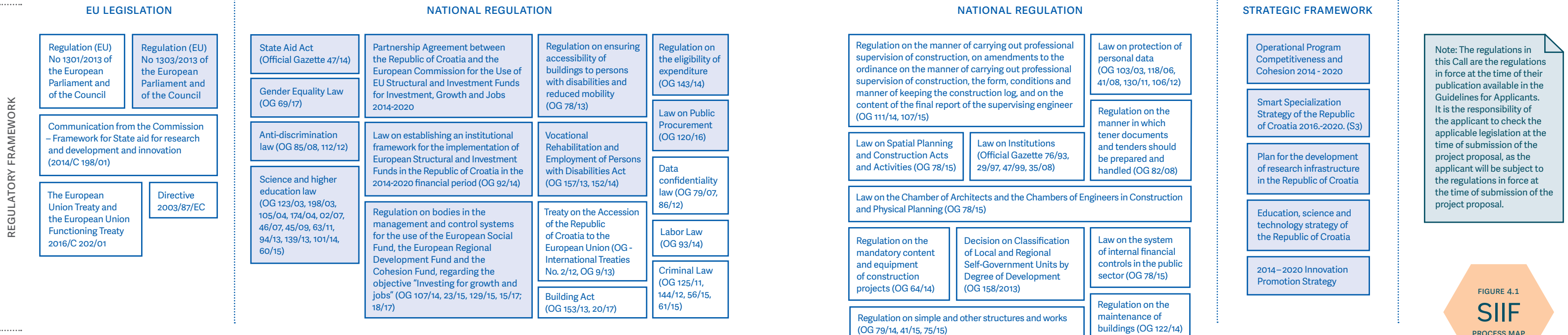
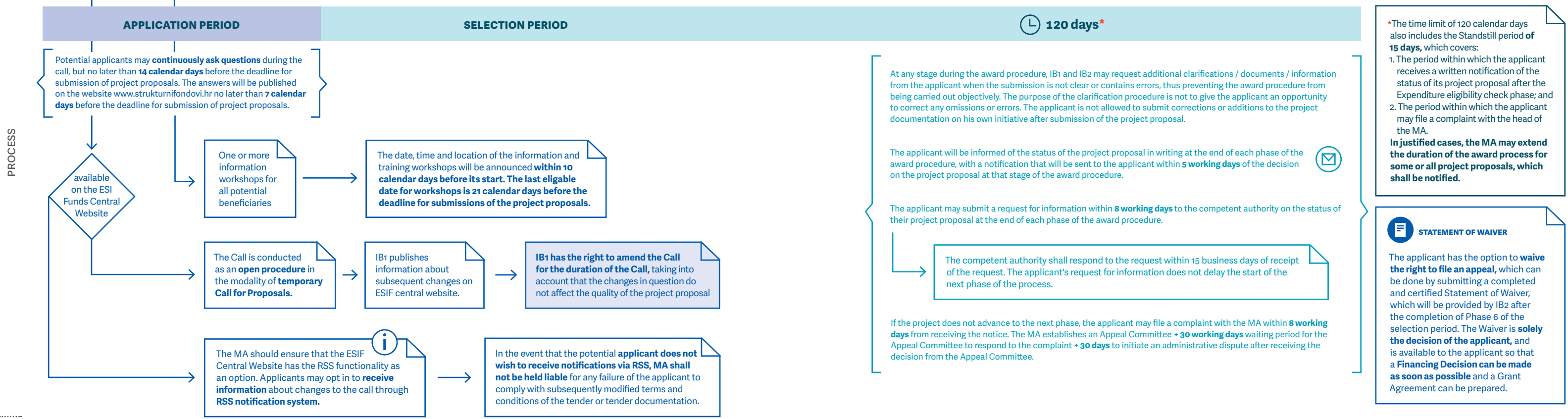
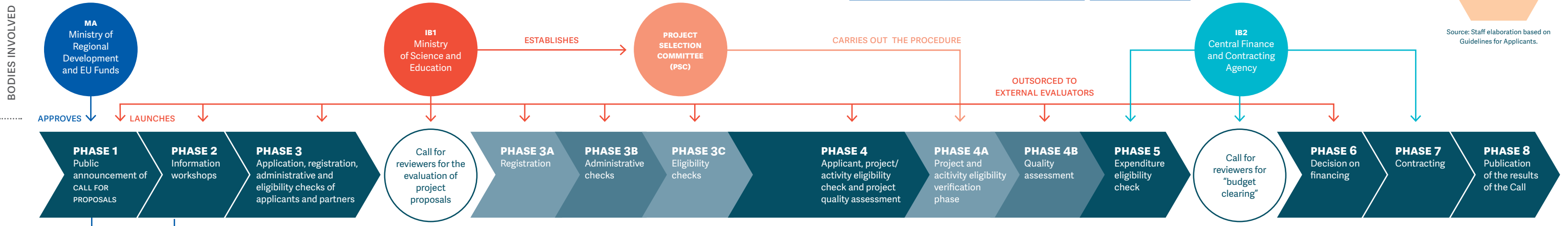


FIGURE 4.1  
**SIIF**  
PROCESS MAP

Source: Staff elaboration based on Guidelines for Applicants.



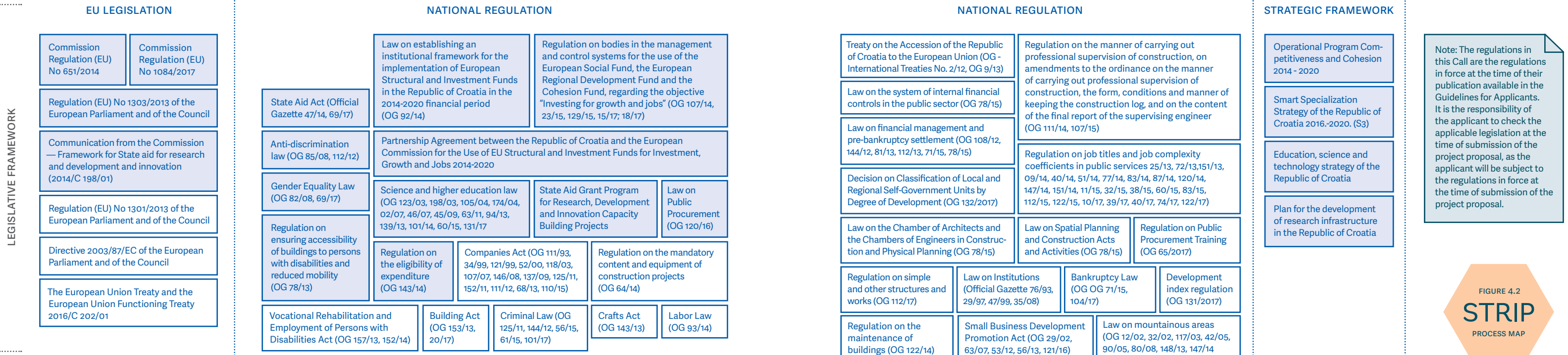
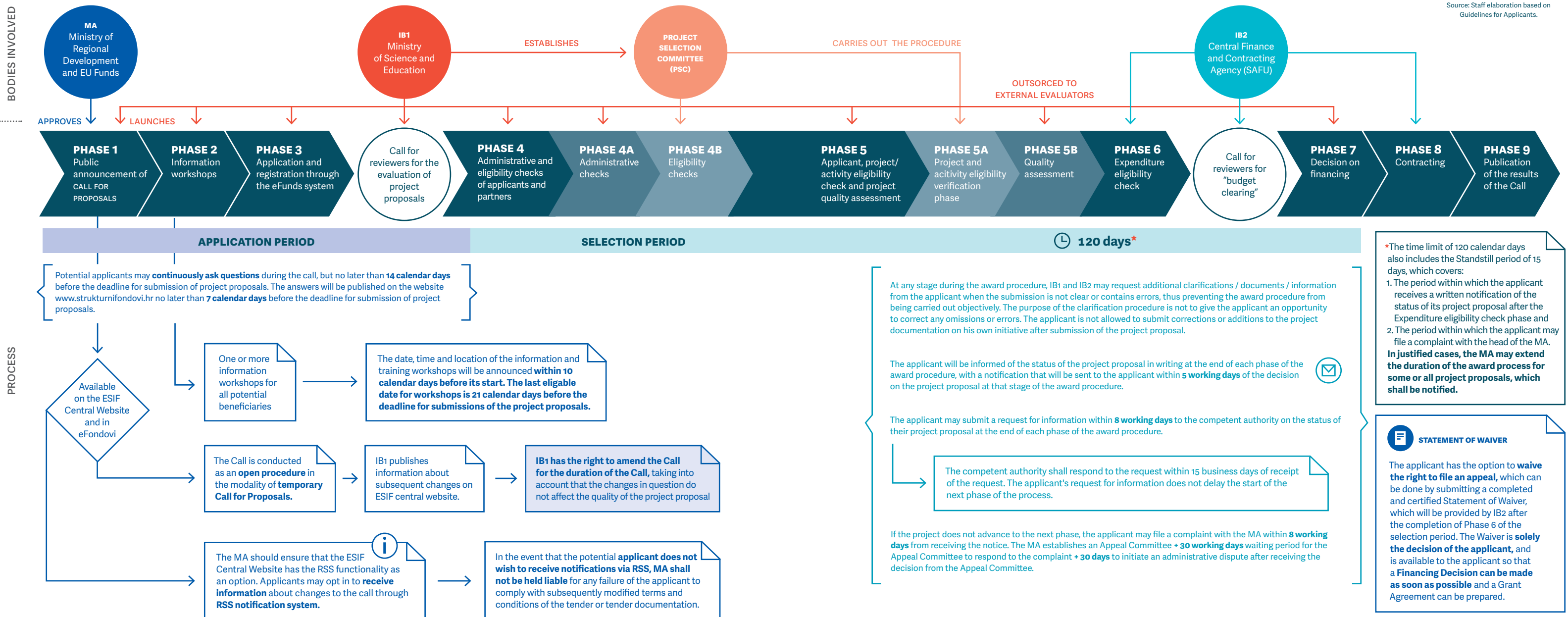


FIGURE 4.2  
**STRIP**  
PROCESS MAP

Source: Staff elaboration based on Guidelines for Applicants.



## Background regulation

**ESIF-funded programs require applicants to become acquainted with extensive and complex background regulation.** Applicants are invited to study the legislative and strategic framework relevant to the program and are required to check whether the applicable legislation was valid at the time they submitted their project proposals. The background regulation referenced in the guidelines for applicants includes between 43 and 53 regulations, strategies, and annexes that the applicant is responsible for reviewing, except in the case of PoC.<sup>39</sup> Even considering that not all background documents must be studied carefully, many documents must be reviewed, and applicants are not provided with information on which are the key regulations required to be checked. In the IRI program, 13 regulations are particularly important when preparing the application documentation, and the numbers for SIIF and STRIP are higher (17 and 19, respectively). Some regulations relate broadly to issues such as antidiscrimination, gender equality, and sustainable development; however, others might be relevant depending on the specifics of the project proposals. For example, applicants planning to hire a person with disabilities would also need to review the Vocational Rehabilitation and Employment of Persons with Disabilities Act.

## Program governance

**ESIF-funded programs have a three-tiered governance architecture, which is more complex than for any non ESIF-funded program.** Responsibilities in the grant award procedure in SIIF, STRIP, and IRI are shared by three different institutions. In the case of SIIF and STRIP, responsibilities for the process are shared between the MRDEUF as MA, MSE as IB1, and the CFCA as IB2. In IRI, the structure is similar, except MEEC acts as IB1 and HAMAG-BICRO as IB2.

**In contrast, for PoC, responsibilities in the process were shared between HAMAG-BICRO and 12 Recognized Centers (RCs).**<sup>40</sup> HAMAG-BICRO was in charge for the program and launched the call for proposals.<sup>41</sup> The RCs' role was to act as contact points with beneficiaries, assisting in the preliminary phase, preparation of applications, and basic assessment and implementation.

## Process overview

**The grant award process can be divided into two periods: application and selection.** The application period starts with publishing the call. In all three ESIF-funded programs, the MA is involved in the very first phase, approving the call for proposals. After obtaining MA approval, the IB1 (in these three cases, MSE or MEEC) proceeds to launch the call, followed by involvement of IB2 in certain selection stages down the road. This was not the case in PoC, where only HAMAG-BICRO was in charge of publishing the calls. For the three

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<sup>39</sup> SIIF references 44 regulations, strategies, and annexes; STRIP references 53; IRI references 43; and PoC references 13.

<sup>40</sup> Entrepreneurship Center Pakrac was abandoned after PoC7 leaving 11 Recognized Centers in PoC8.

<sup>41</sup> As of the eighth call, the program was financed from the national budget and the call was published by MEEC.

ESIF financed programs, the application and selection involve at least eight or nine steps:

- I. Public announcement of call for proposals
- II. Information workshops
- III. Application and registration
- IV. Administrative and eligibility checks of applicants and partners
- V. Applicant and project activities eligibility check and project quality assessment
- VI. Expenditure eligibility and “budget clearing”
- VII. Financing decision
- VIII. Contracting (finalization and signing of the grant agreement)
- IX. Publication of the results of the call

Each of these phases involves a degree of interaction between the various bodies that is not fully captured by the process maps but that can be seen by reviewing the CNRs (see section 4.2). Some phases are more demanding than others, in terms of both the time and the technical knowledge required to complete them.

### Application process

**The application process includes extensive documentary requirements.**<sup>42</sup> For SIIF, MSE required documentation of up to 23 forms and certificates, which had to be submitted in both paper and electronic versions (on CD/USB).<sup>43</sup> The same procedure was used by MEEC for IRI, except that the total number of forms and certificates was 21. For PoC, applicants had to submit up to 17 forms and certificates at different stages of the process.<sup>44</sup> Finally, considering that STRIP is public-private collaboration scheme (which entails a certain complexity), up to 26 documents were required to apply.

**This reveals scope for streamlining and efficiency gains.** Perhaps not all documents need be submitted at the application stage. Some might be required at the contracting stage, and some may not be required at all. IRI’s first call requested that applications be submitted in sealed envelopes/packages solely by registered mail or personal delivery. This issue has been addressed in the second IRI call, which allows applications using a web-based system. STRIP had online applications as well.

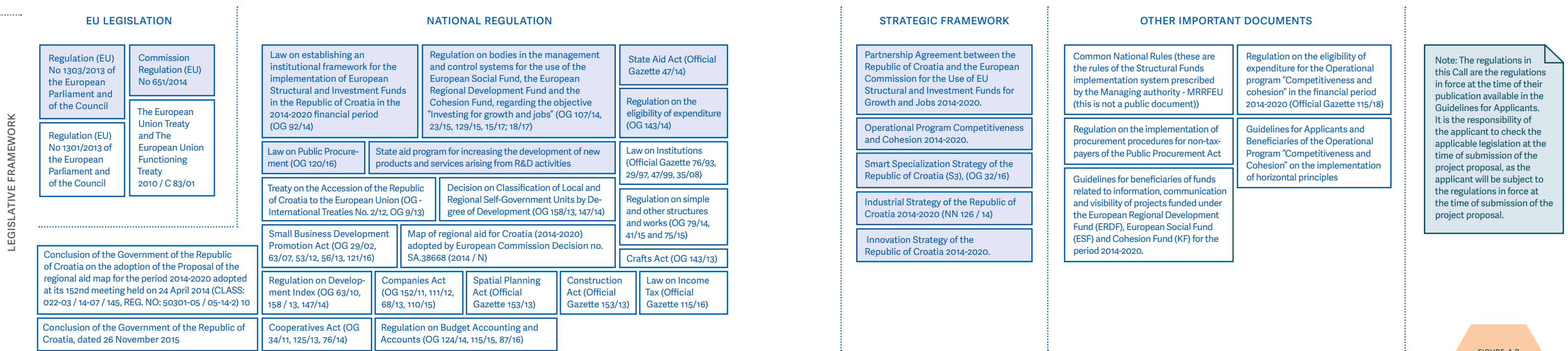
**In PoC, the RCs have a role in facilitating the application process and supporting project preparation.** Before submitting a full application, applicants must pass a preliminary application and pre-evaluation phase. The applicant submits an online pre-application form, and only three additional documents are required. This is a mandatory step that cannot be skipped. The RCs were in charge of preliminary application and evaluation phases. After the applicant submits the preregistration form with all required documents, the RC carries out administrative eligibility checks of the preregistration, and the applicant receives an e-mail notification of the outcome of the administrative check. Only after passing the preliminary application does the project advance to the application phase under the direct responsibility of HAMAG-BICRO. The application phase is relatively simple.

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<sup>42</sup> See Appendix V for a detailed inventory of required documentation and steps for each program.

<sup>43</sup> In the meantime, the MSE transitioned to an online application system.

<sup>44</sup> Four forms at preapplication, seven forms at application, and five forms before contracting.



Note: The regulations in this Call are the regulations in force at the time of their publication available in the Guidelines for Applicants. It is the responsibility of the applicant to check the applicable legislation at the time of submission of the project proposal, as the applicant will be subject to the regulations in force at the time of submission of the project proposal.

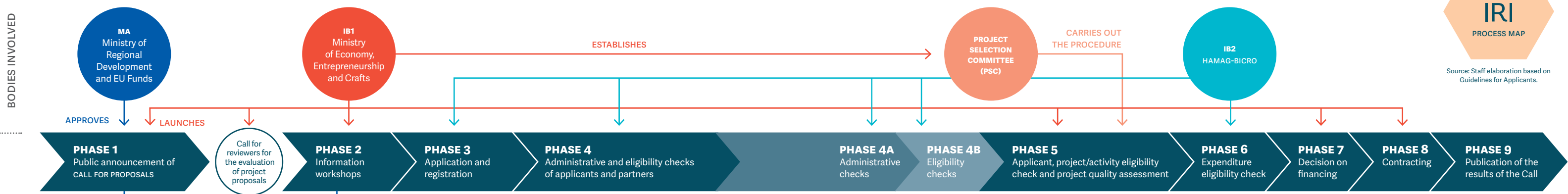
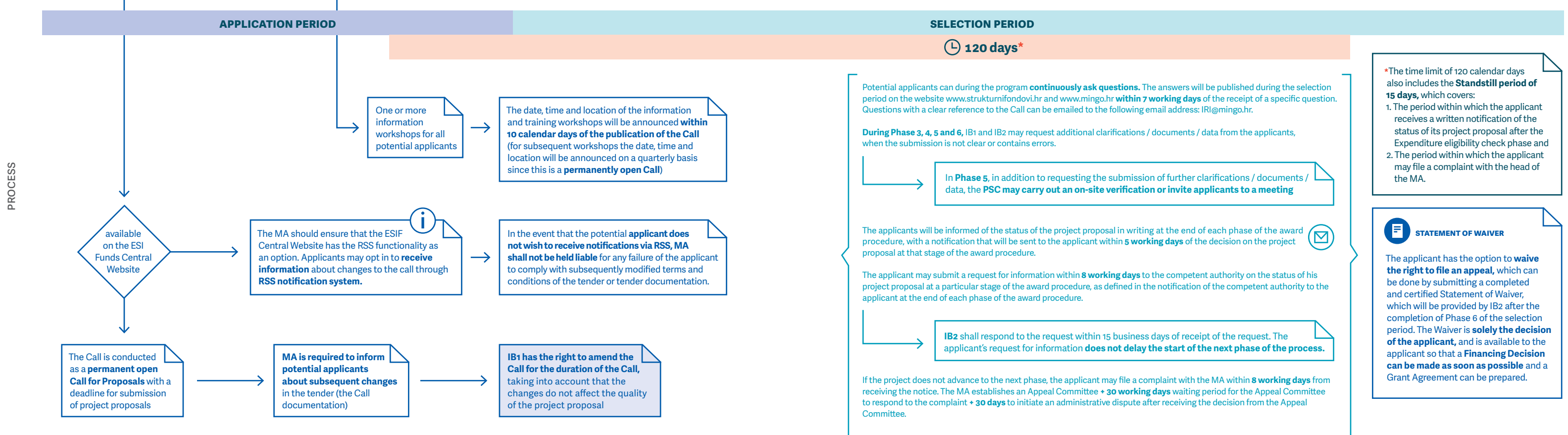


FIGURE 4.3  
**IRI**  
PROCESS MAP  
Source: Staff elaboration based on Guidelines for Applicants.





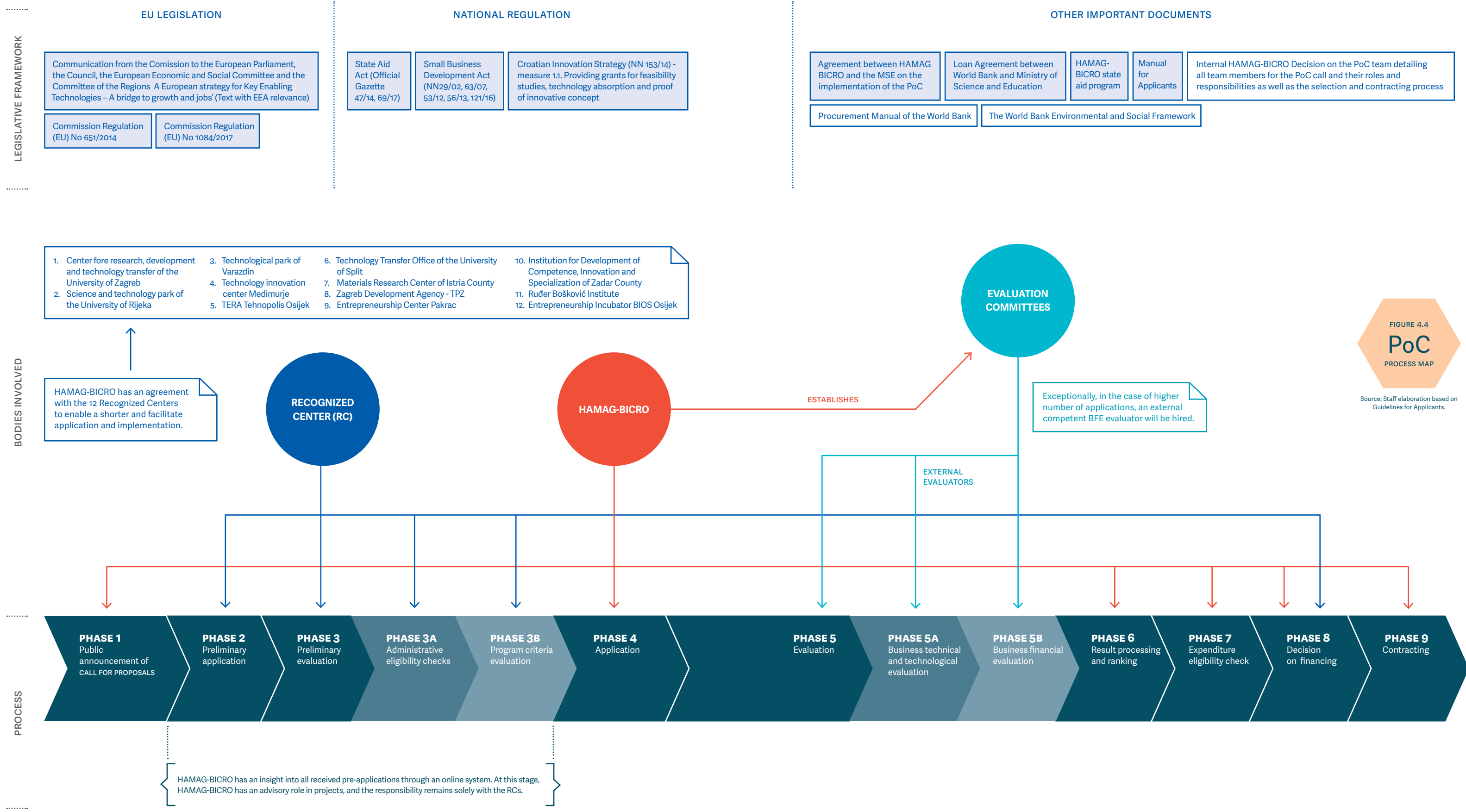


FIGURE 4.4  
**PoC**  
PROCESS MAP

Source: Staff elaboration based on Guidelines for Applicants.

Along with the online application form, applicants need submit only seven relatively easily prepared supporting documents.<sup>45</sup> Applicants have the option to prepare the application by themselves, but the role of the RC was to help and provide advice to the applicant in preparation of the application.

## Selection process

**The selection process is fragmented, leading to inefficiencies, loss of time and knowledge, and possible duplication of process activities.** For IRI, responsibilities for completing the different phases of the process were split between MEEC and HAMAG-BICRO. The process started with all applicants submitting all required documentation to HAMAG-BICRO. If the documentation was in order and after administrative and eligibility checks of applicants and partners, the documentation was sent to the MEEC. After MEEC checked the eligibility of the project and conducted the quality review, the documentation was sent back to HAMAG-BICRO for “budget clearing.” In the final step, the documentation was sent back to MEEC for a financing decision and the contracting phases. SIIF and STRIP followed a similar process of alternating responsibilities and tasks between MSE and CFCA.

**In the selection process of ESIF-funded programs, two separate bodies organize calls for reviewers, which sometimes may respond to same issues.** The selection process, that is, requires publishing two calls for reviewers: one for evaluating project proposals and one for evaluating budget items (so-called “budget clearing”). An expert is not always required for budget clearing, but in many cases one is, especially when it comes to RDI, a highly specific and specialized area. For both SIIF and STRIP, separate calls were organized: first, by MSE for reviewers, and second, by CFCA for experts to assist with budget clearing. The call that CFCA launches also requires experts to assist with expenditure eligibility checks.

**Challenges in procurement of external experts in the selection process caused delays.** SIIF took two years to complete the selection process. A first call for reviewers failed because no appropriate reviewers were found. A second subsequent call also failed. The reason for this was that all project proposals are required to be prepared exclusively in the Croatian language, and for certain niche areas, Croatian-speaking experts with no conflict of interest can be difficult to find. Unable to procure local experts to assess the project proposals, the MSE reached out to the Croatian scientific diaspora. For STRIP, similar problems occurred, leading to delays of over one year. Due to the unavailability of reviewers for project evaluation ex-ante,<sup>46</sup> the call for reviewers was launched late in the process, one month after the application process had closed. The process would have been more efficient if the call for reviewers had been published before the application deadline. For IRI, the process of procuring experts started after the call for proposals was published, but it took longer than expected to finalize and thus prolonged the selection procedure.

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<sup>45</sup> In addition to the online application form, applicants must submit (i) a cofinancing statement or a letter of intent on cooperation with partner (optional); (ii) project budget, cost breakdown, and implementation plan (Excel template available); (iii) supplier offers (at least one offer for amounts above HRK 70,000); (iv) CVs of project leaders and team members; (v) payroll lists for team members; (vi) proposal of employment contract for all persons planned to be employed on the project; (vii) baseline survey questionnaire.

<sup>46</sup> Organizing a pool of experts presents several difficulties, further elaborated in section 4.3.

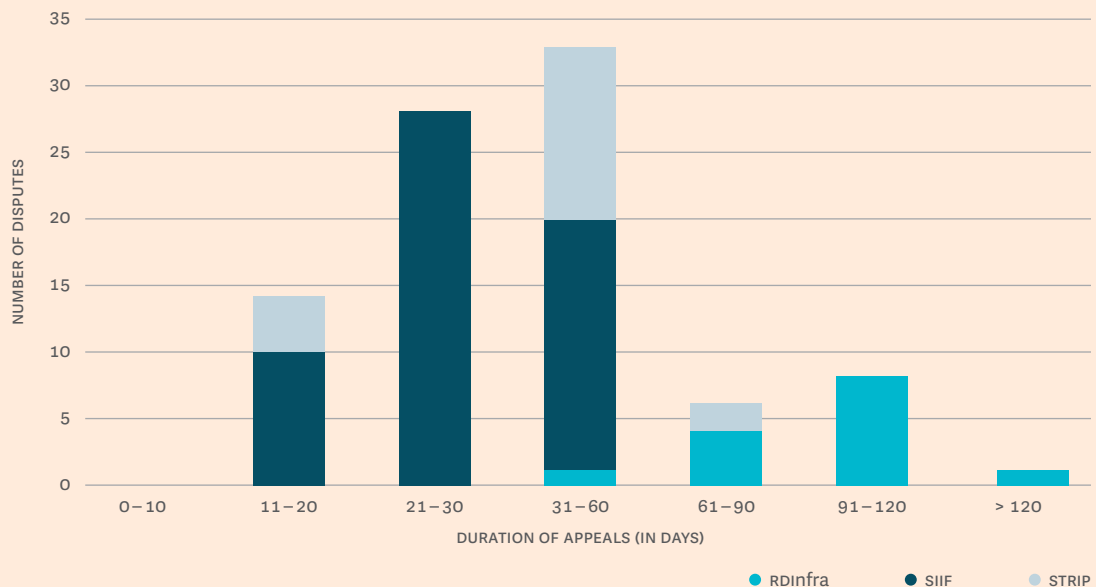
**Applicants can submit appeals at any stage of the selection process, which may take longer if the appeals process is not set efficiently.** Applicants must be notified of the result of each phase, and at the end of each phase they may appeal the result. At each stage of the grant procedure, applicants may file an appeal with the head of the MA within eight working days from the date of receipt of the Project Status Notification. The head of the MA then establishes an Appeal Committee, upon the recommendation of which the head issues a decision. The Appeal Committee has 30 working days to make its recommendation. In practice, the appeal process takes more than 30 days, as the committee is overburdened with appeals (Box 4.1). Anecdotal evidence suggests that, for certain calls, the selection process was blocked by appeals and could not move forward, because the process is interpreted such that it cannot continue to the next phase if appeals are pending in the preceding one. This may be a wrongful interpretation of the CNR or indicate lack of clarity in the CNR. Regardless of the reason, selection is affected and the selection process is significantly slowed, making it difficult to meet the 120-day deadline for the award process.



### Box 4.1 Resolving appeals in Croatia: some examples

**Although the CNR prescribe a 30-day deadline for resolving appeals, in practice this is often not upheld.** Figure 4.5 presents data on the duration of appeals for selected programs led by the MSE. Out of 90 appeals filed in SIIF, STRIP and RDInfra programs, 47 percent are resolved in 30 days or less. Most appeals are resolved within 31 to 60 days, while 10 percent of appeals take over 90 days.

**Figure 4.5** Resolving appeals on award procedures often takes longer than mandated



Source: Staff elaboration based on MSE data.

**Even more severe are delays in resolving appeals related to irregularities.** According to CNR 13 Irregularities, IB2 is obliged to issue a decision on irregularity within 30 workdays after a suspected irregularity has been identified. In practice, for MSE programs, the decision on irregularities takes 60 days on average and in several cases took more than 150 days. Once the decision on irregularities is made, beneficiaries have the right to appeal the decision to the MA. Out of 67 irregularities, there have been 28 known appeals,<sup>47</sup> and only one appeal has been resolved, after 280 days. Some of the remaining unresolved appeals were filed in January 2019 (over 500 days ago) and the average wait time for the outstanding appeals is 246 days and counting.

**Unlike ESIF programs, most of the responsibilities for the PoC selection process were contained within one institution (HAMAG-BICRO), and the process itself was more fit for the purpose of the program.** Quality assessment of project proposals is performed by an Evaluation Committee<sup>48</sup> and consists of two assessments. One concerns business, technical, and technological criteria, and involves checks on documentation and eligibility criteria, while in parallel, an internal expert assesses business financial criteria. After that, applicants are invited to present their projects in front of the Evaluation Committee. The presentations are organized into technological areas, and the applicants are invited to give ten-minute pitches and defend their project proposals. The final project evaluation consists of weighted average scores of the individual criteria. After completing the evaluation process, a final ranking list is prepared with a recommendation for funding to HAMAG-BICRO's Management Board. After that, "budget clearing" is performed. Due to budget limitations, even a positive evaluation does not always guarantee funding. Ranking lists are prepared, and, depending on the outcome, HAMAG-BICRO issues a cofinancing offer or a notification of nonacceptance of the project. If applicants accept the decision on financing, they then need to submit another five relevant documents to the RC, which HAMAG-BICRO reviews. The final step of the selection process is signing the Grant Agreement. From application to contracting, the process takes between 75 and 150 days, depending on the call. Appeals are dealt with through an internal committee of HAMAG-BICRO comprised of two legal experts and one technical expert. Appeals were restricted to complaints on procedures; complaints about the substance of project selection were not considered.

### Main takeaways from the process diagnostic

**The process diagnostic revealed that ESIF-funded programs share a common process structure and therefore face common process bottlenecks.** These include burdensome documentary requirements, fragmentation in the selection process, and duplication of efforts to procure reviewers, resulting in delays in implementation. Such delays are not observed in programs funded from the national budget. The next logical step is to

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<sup>47</sup> MSE has information on submitted appeals on irregularities only if informed by the beneficiary.

<sup>48</sup> HAMAG-BICRO establishes different Evaluation Committees consisting of external experts. Experts were selected to evaluate individual projects in different areas of competence, depending on a project's nature.

understand what lies behind the commonalities observed in ESIF-funded programs. The process is regulated by the Common National Rules (CNR), which constitutes the operational framework for OPCC implementation. Section 4.2 examines the CNR in more detail to identify sources of inefficiency and pinpoint areas for improvement.

## 4.2 Review of selected Common National Rules

**The CNR serve as an operational basis for all Croatian institutions involved in implementing OPCC 2014–2020, which supplies most innovation financing.** The CNR are expected to set out conditions for the ESIF management and control system (MCS), including: programming and strategic planning, forecasting and monitoring, evaluation and closure of programs, audit trail, and use of technical assistance, as well as project preparation, selection, contracting, implementation, checks and payments, and other important procedures related to ESIF implementation (e.g., irregularity management). The Minister of Regional Development and European Union Funds, acting as the Managing Authority for the OPCC, is responsible for adopting all CNR for that OP. At the moment, 15 rules are approved under the CNR.<sup>49</sup> In addition, each institution must develop internal manuals of procedures aligned with the CNR and approved by MA.

**The CNR generally address bodies involved in the MCS, regulating their mutual rights and obligations along with necessary procedures, but they are not published.** The only exception is CNR 1 on the eligibility of expenditures (with the status of Minister's Ordinance), which covers aspects directly addressed to OPCC beneficiaries. Despite their relevance and importance for beneficiaries, the CNR are only available to the institutions in the MCS and are not published. Further, the MA frequently issues instructions, clarifications, and interpretations of the CNR, which also remain unknown to the public while affecting applicants and beneficiaries. This is not the case in Poland and Bulgaria, where any interested party can easily access the CNR (see Box 4.2).

### Box 4.2 Overview of national rules for implementation of ESIF funds in Poland and Bulgaria



#### Poland

As of May 2020, Poland had 70 binding Guidelines that set general standards for implementing 22 OPs (including 16 regional OPs). The Guidelines are rooted in national law and cover ERDF, ESF, and the Cohesion Fund. The Minister for regional development approves all Guidelines. The Guidelines are publicly available via dedicated portal (EU Funds Portal)

<sup>49</sup> It is estimated that they cover more than 2,000 standard-sized text pages.

that supply all regulations, other important documents, and information related to EU Cohesion Policy implementation in Poland. The portal allows users to track and trace all changes made to date in the Guidelines and other important documents.

## Bulgaria

The rules for grants funded by ESIF for 2014–2020 have the status of decree in Bulgaria. The framework is entirely public and can be accessed online through free or subscription-based services. Decree 162 determines:

- The detailed rules for providing grants under the programs financed by the European Structural and Investment Funds for the period 2014–2020;
- The structural composition of the commission for evaluating project proposals in a call for proposals, the requirements for persons participating in it, and the rules for the commission’s work;
- The requirements for persons performing evaluations in cases of directly awarded grants, the persons inspecting received objections, and the persons evaluating concepts for project proposals;
- The rules for providing information and publicity regarding gratuitous financial aid.

Source: Staff elaboration.



**With the experience of implementing OPCC, analysis of the CNR could serve as a background to prepare Croatia for the next generation of EU Cohesion Policy programs after 2021.** Without doubt, the lessons learned from OPCC implementation, including experiences gained from CNR preparation, adoption, amendments, and “daily” use, should result in better solutions. These solutions will not only help under the current program, but they will be especially important in the next generation of EU programs. In this programming period Croatia is experiencing issues in implementing OPCC 2014–2020 related to absorption capacity, including in the RDI area. While a substantial portion of the funds are committed, they have yet to be absorbed. Taking this into account, it is worth investigating the extent to which the CNR hamper smooth operations within OPCC and what could be modified or improved inside the CNR to make them more supportive for this and/or for the next financial perspective.

**Efforts by the MA to simplify and improve the CNR procedures must be acknowledged.**

In May and June the CNR received two consecutive updates introducing changes that included increased thresholds for direct procurement (for firms), the possibility of using pools of experts, allowing parts of the application subject to quality assessment to be submitted in English (at the IBs suggestion), and others. More work remains to be done, but these recent changes should serve as a useful testing ground for the next programming period.

**All the findings, considerations, and conclusions in this section are based purely on the text of the CNR and relate to the point of view of RDI funding.**

The conclusions presented here are the result of desk review and are only preliminary. Poland was used as a reference case (due to its better absorption results relative to Croatia),<sup>50</sup> while both Poland and Bulgaria are used to compare procedures relating to selected CNRs. Further in-depth investigation could be conducted if required by specifics in the Croatian ESIF implementing environment and institutional setting. The analysis focuses on the following CNRs:<sup>51</sup>

- **Rule 2.** Management and control systems
- **Rule 3.** Human resources management
- **Rule 5.** Execution and management of grant contracts
- **Rule 6.** Grant award
- **Rule 14.** Financial instruments
- **Rule 15.** Integrated territorial investment

Some of the suggestions provided are operational in nature and could be easily implemented.

## **CNR 2 Management and control systems**

**The multitude of institutions involved in the MCS could be a source of unnecessary complexity and administrative burdens that require substantive coordination efforts.**

The system appears quite complicated because almost every thematic area (and RDI) has three decision-making levels.<sup>52</sup> This issue could be one source of the problems related to spending levels within the OPCC.

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**50** Croatia had the lowest percentage of spent ESIF funds in the EU in 2019 (31 percent of planned funds). In comparison, Poland had 41 percent and Bulgaria 40 percent.

**51** They make up almost 90 percent of all CNR content and can be deemed critical for OPCC implementation.

**52** See further details in sections 4.1 and 3.11.

## Box 4.3 Institutional setup in the MCS in Poland and Bulgaria

### Poland

The RDI topic is covered by the National Centre for Research and Development for the countrywide Smart Growth OP or regional development agencies in the case of Regional OPs. As a single body, each is solely responsible for project assessment, selection, and contracting.



### Bulgaria

In the current Programming Period in Bulgaria, no IBs have been established; the MA of the respective OP governs the entire OP. For example, the Operational Programme for Innovations and Competitiveness is governed by General Directorate in the Ministry of Economy. In the previous programming period (2007–2013) IBs were used. The government decided to consolidate control over OPs, however, and removed all IBs for the next programming period.



Source: Staff elaboration.

**It seems suboptimal that no agreement between IB1 and IB2 is envisaged.** While it is necessary to have a closer look at the Agreements on the Delegation of Duties between the MA and all IBs, it appears that IB1 and IB2 each have their agreements with MA but that no contractual link exists between IB1 and IB2. This could be a source of management inefficiency.

**The rules on eligibility of expenditures could benefit from further granularity.** CNR 2 mentions eligibility of expenditures in the context of CNR 1 (Rulebook on eligibility of expenditures), which is a government ordinance. CNR 1 seems in many cases too general, however, which may cause interpretation problems, translating into possible conflicts among MCS institutions as well as between them and beneficiaries. An option to consider is to have a detailed and relatively easy to modify “normal” CNR elaborating on eligibility of expenditures, rather than raising it to the status of government ordinance, which is difficult and time-consuming to amend.

**The division of responsibilities between MA and IBs can be improved and clarified.** Based on CNR 2 the MA supervises the performance of delegated functions at the IB level, which is fully justified. The problem, however, is that other CNRs (e.g., CNR 6, Grant award) give the MA a much more “consent” type of power, which may depreciate the IBs, reducing them to purely executive roles, despite their high potential in many cases. The MA seems to be immoderately involved in operational details, which might be at the expense of the MA’s strategic and coordinating functions. For example, when only one evaluator assesses a project, the MA’s prior consent is needed. The same is true when the deadline for submission of project proposals is shorter than 60 calendar days from the date the



call for projects is launched or when the deadline for signing the Grant Agreement must be extended. Prior consent is also required for some irregularity decisions or if extending the deadline to establish irregularities is necessary.

## Box 4.4 Flexibility in defining the content of calls in Poland

### Poland



The minimum scope of the applicants' pack for a call is determined by the national legislation and the Guidelines on project selection. It is, however, up to the respective body organizing a call to finally shape the applicants' pack by adding, for example, guidance papers. Also, the structure of the application form and supporting documents (e.g., feasibility study, CBA, business plan, etc.) should reveal clearly to the applicants what projects are expected by MA/IB in a given call.

Source: Staff elaboration.

**The organization of the first instance of appeals can be readjusted by assigning this responsibility to IBs.** Currently, the MA is responsible for beneficiaries' appeals in the grant award process before they go to court. This is based on legal and procedural solutions developed by the MA. The question is to what extent the MA can decide on the substance regarding, for example, a complaint about the quality review. Other countries' experiences (further elaborated below) suggest that allowing IBs to deal in the first instance with beneficiary appeals in the grant award process may be more effective and efficient.

### CNR 3 Human resources management

**The Workload Analysis could be extended by including internal evaluation of task division among MA and IBs.** The analysis currently aims to analyze and ensure the appropriate numbers of employees necessary for timely performance of tasks in each of the MCS institutions. It does not cover the internal evaluation of task division among MA and IBs, however, taking into account the efficiency of the OPCC and project implementation. Considering this could help improve coordination and ensure faster decision making when implementing the OPCC. The Workload Analysis should show areas of surplus and shortfall within the entire system.

**If set properly, the Organizational Development Strategy can bring long-term stability and operational quality to the MCS institutions.** The Strategy contains a comparative overview of the available and required administrative capacity for the years 2014–2020. It should also consider different options for employee incentive schemes and career paths as well as key assumptions for making long-term employment in ESIF administration attractive for current and future staff. In addition, the register of trainings obligatory for

every employee should be preceded and complemented by a longer-term master training plan for each institution under the OPCC. (Currently, staff have annual training plans.) The master plan should include a consistent and justified agenda of intensive trainings both for employees and external experts, especially those taking part in the project assessment and selection process. The master training plan could cover two to three years and be translated into annual action plans if necessary.

**The Employment Plan should serve as a smart tool to manage internal staff relocations and promotions, better preparing all MCS institutions for changing requirements and circumstances.**<sup>53</sup> In practice, the employment plan usually focuses on additional employees needed from outside of the IBs/MA. The Employment Plan should take into consideration the findings of the Workload Analysis in terms of surpluses and shortfalls in staff numbers in particular organizational units and thus ensure flexibility in staffing through internal staff relocations and new employment (if needed). The relocation option should be seen by both the MCS institutions and the employees as an innovative way to broaden and strengthen skills and competences, opening up new possibilities for professional development.

#### **CNR 5 Execution and management of grant contracts**

**Some of the scope and volume of work defined in CNR 5 (both at the IB and the beneficiary level) is high and requires significant time and financial and human resources.** This relates especially to ex ante and ex post verification of procurement documentation, verification of payment claims (including sampling), on-the-spot checks (including sampling), and identification of irregularities. These processes seem overly prescriptive and demanding. Still, in the case of irregularities, beneficiaries' testimonials suggest that stronger justification is needed for irregularities found. Moreover, the time required to handle irregularities cases has been rather long.

**It would be beneficial to further promote and expand advance payments for beneficiaries.** Currently, advance payments are possible only after beneficiaries provide a debenture or an advance payment guarantee. Due to high cost to beneficiaries of the advance payment guarantees, the IBs should consider using debenture as a collateral more often and for larger amounts of advance payments. The widespread use of advance payments may contribute significantly to faster implementation of projects as well as to the OPCC as a whole (see Box 4.5 for practices in Poland and Bulgaria).

**Use of the simplified cost option (SCO) should be facilitated, as it reduces administrative burdens and simplifies compliance checks for both beneficiaries and IBs.** SCO is particularly beneficial for projects or programs supporting R&D and business development because it is mainly used to cover personnel costs and general indirect project costs. It is likely that the vast majority of beneficiaries use "incurred costs," which is not bad, but

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**53** For example, the need could arise to relocate people from project submission and assessment units to project implementation units. Human resources dedicated to project controls should be increased, probably immediately, since the annual number of project checks will rise significantly along with the number of implemented projects.

it still seems justified to treat SCO seriously in terms of simplification, especially in case of ERDF projects in which SCO use could generate huge time savings. The CNRs could in addition promote SCO by providing examples of best practice.

## Box 4.5 Advance payments and disbursement methods in Poland and Bulgaria

### Poland



Advance payments are envisaged in the grant agreement. They can be paid out upon the beneficiary's request (also in tranches), according to an agreed-upon timeline, provided that adequate financial resources are at the disposal of the MA/IB. Advance payments must be supported by collateral (blank bill). Generally, the maximum level of advance payments for ERDF could not exceed 90 to 95 percent of total EU support for a project depending on OP. Advance payments to beneficiaries are currently extremely popular, especially among public sector beneficiaries and NGOs.<sup>54</sup> In addition, more and more enterprises use advance payments if they are able to accept the risks and costs relating to collateral.

### Bulgaria



Method of reimbursements is obligatory in all calls. The beneficiary makes the required payments to other parties and then files a request for payment to the MA, which reimburses the costs or part of them. The method of payment whereby the beneficiary submits the bills together with the payment request and then the relevant body pays (the subsidy part of the bill) directly to the provider of services/works is not applicable in Bulgaria. An option of advance payment within a short period after signing the contract is available; however, the managing authority will always require a bank guarantee before providing the advanced payment.

Source: Staff elaboration.

### CNR 6 Grant award

**Project assessment procedure could be streamlined, even more so considering the bottlenecks found in practical terms.** Many of the delays in project selection are related to ineffectiveness and inefficiency in some of the steps anticipated (see section 4.1). Reducing the number of stages would not necessarily eliminate delays, but it could help. Furthermore, scope exists for reorganizing procedures. More specifically, according to CNR 6,

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<sup>54</sup> For example, it is estimated that not less than 70 to 80 percent of beneficiaries use advance payments in Regional OPs.

project assessment can include up to five stages. IBs may suggest to the MA doing it in less by merging some steps. All things considered, it seems reasonable to have three instead of five stages. This can be done by conducting a single/unified eligibility assessment (without dividing it into applicant/partner, project, activity, and expenditure eligibility check). It appears strange to have expenditure eligibility check after quality assessment. The process of budget clearing can be bundled with the quality assessment. Both aspects require expertise, and by covering this in a single step, the need for time and resources can be reduced. The three main stages of project selection can include: i) administrative/admissibility check; ii) eligibility check; and iii) feasibility/quality check (including decision on grant award). This or a similar solution is used in other EU countries (e.g., Poland) for ERDF projects.

**Major assessment work (eligibility and quality checks) should be done by Project Selection Committees (PSC) mainly composed of external experts organized into panels.** Even when eligibility checks are done by the PSC's internal experts, involving external experts earlier, rather than only at the end for the quality assessment, would be a good move. Panels also help to improve the grasp of the proposal and the team standing behind it. (The panel approach is elaborated further below.) For all this to work efficiently, pools of experts must be established and nurtured.

**The appeals process may be reorganized by allowing the first instance to be managed by the IB organizing the respective call for projects.** Under the current approach, the MA handles the appeal process at the first (pre-judicial) stage. This may lead to longer decision-making processes, as well as demanding communication with various parties. The MA could experience objective barriers when going into details related to the context of the respective call for projects or to practical problems connected with application assessments.<sup>55</sup> For this reason, having a separate (dedicated and functionally independent) IB unit deal with appeals (complaints) could provide a more efficient solution without losing transparency.<sup>56</sup> Only a clearly confirmed risk of corruption at the IB level would move the appeal to the MA level.

**Appeals should be streamlined and should not stop the decision-making process, a condition crucial for efficiency.** Having clear prerequisites for submitting appeals could help prevent many unjustified complaints. This could be done in many ways; for example, the number of complaint "windows" could be limited (e.g., complaints would be welcomed only at the end of the assessment procedure) or requirements for complaint filing could be put in place (e.g., a certain threshold of points received could be required). This could help to reduce some of the burden on the MA and the IBs while giving them more space to focus on quality of work. In any case, when an appeal is filed, it should not impact the entire batch of projects under assessment, just the one being appealed (see Box 4.6).

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<sup>55</sup> In practical terms, this means the MA is expected to go deeply in the structure of the application form and the content of the respective application under complaint. It means also that all selection criteria should be learned and fully understood by the MA officers dealing with the complaint, along with all the instructions on how to use these criteria. In addition, the substance of the project must be understood, together with the expectations defined for the whole call for projects. All in all, the MA must build competence on project assessment to resolve the complaint. This is possible, but it seems more efficient to use the competence that already exists in the IB responsible for organizing a given call for projects.

<sup>56</sup> This solution proved successful in Poland.

## Box 4.6 Appeal procedures in Poland and Bulgaria



### Poland

Resolving appeals is a two-stage process. It covers first, a protest, and second, the complaint. Protests are handled by bodies running a given call for projects and could involve the MA in some cases. Applicants must send a protest within 14 days of receipt of information about a negative assessment. Every protest must be solved within no more than 21 days at the latest from the date of its receipt. Even for extremely complicated cases requiring, for example, external expert involvement, the entire process may not take more than 45 days. Complaints are handled by administrative courts. The complaint phase should be finalized within 30 days of the date the claim is submitted to the regional administrative court and within 30 days from the date the claim is submitted to the supreme administrative court.

Different options (depending on OP and MA) are available as protest options for applicants. In some R&D calls for projects under Smart Growth OP, an applicant can protest only once (at the end of the award procedure). In the case of regional OPs, applicants can generally protest up to three times (at the formal, feasibility, and strategic assessment levels).

Resolution of appeals in Poland does not stop the project assessment and selection phase or project contracting phase. This allows a full cycle for a given call for projects, including project collection, appraisal, and contracting, to be organized without delays caused by appeal processes.



### Bulgaria

The decisions of the MA may be challenged through litigation before an administrative court. The evaluation process is separated into two phases (administrative evaluation and technical and financial evaluation), and the application may be rejected at the conclusion of each. Applicants may challenge the MA's decision in administrative court at both of these points. No appeal before the MA is allowed. The filed appeal does not halt the evaluation of other applications or the award process for other applicants.

Source: Staff elaboration.

## CNR 14 Financial instruments

**The CNR could be strengthened by adding clear rules on reviewing and updating the ex ante assessment of financial instruments during implementation.** The assessment may no longer accurately represent market conditions, in which case the MA should be able to update it based on predefined rules. The decision not to establish financial instruments for R&D activities under Priority axis 1: Strengthening the Economy through Application of Research and Innovation lies outside the CNR. The ex ante assessment established market failures or suboptimal investments and indicated the possibility of combining

financial instruments with other forms of financing.<sup>57</sup> Although the analysis recognizes that, currently, financial instruments could only partially address the investment gap for R&D, it also notes that by not including financial instruments for this topic in this programming period the possibility of learning by doing will not arise. This means that the use of financial instruments in the research and innovation area will have a steep learning curve in the next programming period. The CNR could establish rules or recommendations for when ex ante assessments could be updated or revised.

### **CNR 15 Integrated territorial investment**

**The ITI mechanism aims at long-term growth of functional urban areas, but it allows a narrow thematic scope in the current period.** Even though the thematic scope has been decided outside of CNR 15, a procedure could be established for the next programming period that would permit choices from a broader thematic scope. This must be accompanied by clear criteria (guidance) for the type of investments that could fall under the integrated territorial investments. By doing so, ITI's coverage could include more interventions dedicated to shaping important functions of (metropolitan) urban areas, e.g., university-driven city-forming functions.

## 4.3 Practical guidance for increasing ESIF commitment and disbursement<sup>58</sup>

**Commitment and disbursement retardants are two groups of factors influencing the quality and pace of OPCC implementation.** Commitment retardants are factors that extend the timespan for project selection and lead to delayed contracts/commitments. Disbursement retardants extend the timespan for project implementation and result in delayed disbursement. Different measures could be used to limit the impact of these retardants. Only some of them have a strong, direct link to the exact content of CNRs. In the majority of cases these measures could be treated as general signposts and principles for the entities in the OPCC institutional ecosystem and its successor program.

### **How can commitment retardants be defeated?**

**Before applications are submitted:** *Creating a project pipeline and support quality proposals*

- 1. Access to information.** The supply of projects and applicants' potential present numerous challenges. It is thus worth strengthening the quality of information applicants

<sup>57</sup> See articles 37 to 46 of Regulation (EU) 1303/2013.

<sup>58</sup> All the remarks in this chapter have been prepared with RDI operations and support in mind. They may not necessarily be valid for other areas of public intervention (e.g., transport or energy infrastructure).

receive through different (mainly digital) channels. Micro and small enterprises applying for the first time for RDI ESIF funding seem especially in need of support. Simple, reliable information should be provided. One way to do this is to intensify the role of MA/IB information officers in communications with beneficiaries. In many cases, the biggest challenge is the operational (practical) knowledge and real experience of those assisting applicants. These persons should have experience applying for and implementing ESI funding (in the public/private sector) and the skills needed to help applicants.

**2. Project preparation support.** To increase the quality of project ideas, applicants would need more support in preparing applications. It could be necessary to create guidebooks containing good and bad project examples.<sup>59</sup> The guidebooks should also indicate how the key issues in the project assessment process should be interpreted and how to satisfy them at the level of the project. Further to this, trainings and intensive workshops for applicants must be provided that focus on practical explanations of terms and definitions, including relevant examples. Such workshops (organized mainly for smaller groups but held at several locations across the country) should provide useful and practical knowledge in such areas as the following:

- How exactly projects are assessed (the criteria used and how they are applied and by whom);
- The most challenging issues to be solved when designing projects, including defining milestones, setting targets, dividing tasks efficiently among partners, managing risk, etc.;
- The most demanding parts of the application forms and the most common mistakes applicants make when completing them;
- The best possible support schemes for different types of projects.

It is also necessary to raise the applicants' awareness of the challenges and risks related to the implementation of RDI project at the initial application stage. Hence, trainings should also focus on the quality of descriptions for the most problematic issues, such as project milestones, technological risks, intellectual property rights, or administrative obligations in a publicly cofinanced project.

**3. Selection criteria.** The design and content of the project selection criteria<sup>60</sup> can significantly improve the applicants' perception and understanding of the "rules of the game." It is advisable to use clearer and simpler descriptions of the selection criteria, bearing in mind that standardized criteria for the entire OPCC, in the absence of standardized beneficiaries and types of projects, makes limited sense and does not provide space to react to changes in the wider OPCC implementation context. Given this, the general approach to setting up project selection criteria should be reconsidered. This applies especially to the key selection (quality) criteria, which should be treated

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<sup>59</sup> CFCA has produced several guides and brochures for beneficiaries, but more can be done.

<sup>60</sup> The quality criteria especially must use a sufficiently wide scoring scale in differentiating project proposals. They also cannot be correlated with each other. Otherwise, the applicant population is assessed similarly; small scoring differences between the best and the weakest proposals encourage appeals.

as an important management tool (see Box 4.7). It should be feasible to adapt criteria smoothly to the changing OPCC implementation context. Some upgrades in selection criteria can be discussed and decided at every Monitoring Committee meeting (MC). All improvements should be based on experience from earlier calls for projects<sup>61</sup> as well as on the advancement of the OPCC.<sup>62</sup>

- 4. Selection process.** The project selection system, including selection criteria, should be continuously verified and adjusted, thus creating a better environment for the most desired and valuable projects. Adequate highlighting of changes made in the system should be made easy to find and understand for all interested applicants so they can prepare in advance for calls for projects.

## Box 4.7 Selection criteria in Poland and Bulgaria

### Poland

The Polish Guidelines on project selection provide a set of methods and principles to be used to properly define, shape, and apply project selection criteria for national and regional OPs. There are three general groups: formal (eligibility) criteria, feasibility criteria, and strategic criteria. Much freedom is given to different MAs/OPs to set their own nomenclature, however. MAs are responsible for final drafts of selection criteria or draft amendments before final approval by the MC. IBs are always actively involved (sometimes even as a key knowledge-and-idea provider) in drafting and redrafting selection criteria. It is a common practice to organize ad hoc working groups before the MC meetings. Such groups (composed of MA, IB, and MC representatives) analyze all the proposals for selection criteria and try to reach common understanding to avoid any ambiguity or misinterpretation while using these criteria.

Project selection criteria are treated as an important management tool. Because of that they are changed many times over the OP implementation period.

### Bulgaria

The Managing Authority is empowered to develop the evaluation methodology for project proposals. The criteria can be separated into two categories: administrative and technical/financial. Some of the administrative criteria are established in the Act on management of funding from the European structural and investment funds and are applicable to all grants, but some administrative criteria are developed by the MA for a specific grant. All technical/financial criteria are tailor-made by the MA for every specific grant. All criteria are discussed with the MC before publishing the Guidelines for Applicants.

Source: Staff elaboration.

<sup>61</sup> For example, in new calls, new criteria could be added on top of existing criteria to respond to changing circumstances.

<sup>62</sup> For example, which goals are close to or far from expected values.





**5. Planning and predictability.** Calls for projects must have well-thought-out organizations and be planned for properly over time. If few calls occur or their timetable changes often, it is difficult for applicants to plan their investment. Further, applicants may be convinced that a particular call is the last and only one, leading them to make extra efforts to get a grant. This could increase the number of applications and appeals of assessment results. Calls for projects divided into several separate rounds with defined deadlines to submit applications could accelerate project assessment and take the pressure off both the MA/IBs and beneficiaries. This would potentially lead to better-quality proposals and smoother IB workflows and promote more direct learning from process policies, with the higher frequency of publishing calls providing more opportunity to integrate lessons learned from program preparation within a shorter timeframe. Another helpful solution would be to use two-stage project calls, with initial (short) concepts assessed first before full applications are prepared for concepts that pass the first stage review.<sup>63</sup>

#### ***After project submission: Assessing projects***

- 1. Duration of project assessment.** The longer project assessment takes, the bigger the potential negative impact on project innovativeness and feasibility (due to rapid market progress). Hence, to ensure the system's credibility and predictability, it is essential to unconditionally adhere to the assessment deadlines. Consequently, it will be extremely important to mobilize human resources of sufficient quality and quantity to perform the project assessment. To ensure accountability, information about average application assessment times must be widely disseminated.
- 2. Improving submitted project proposals.** Changes introduced in the project assessment system should allow for the effective selection of good projects, which does not necessarily mean a selection of good applications.<sup>64</sup> Better elimination of proposals that fail to meet the assumptions envisaged for respective intervention instruments or respective calls for projects is needed, especially in the RDI area. One option to improve the quality of project proposals is to allow project applications to be amended based on requests from experts, provided that the maximum scope of corrections is defined beforehand by the IB responsible for the selection process.<sup>65</sup> The two-way interaction between experts and the beneficiary should help to better identify sound project proposals. Experts' comments<sup>66</sup> (made at meetings with the applicants or in writing), by helping to remodel essential aspects, could transform projects and make them easier to implement and more cost effective.<sup>67</sup> Such a solution opens up possibilities for better

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**63** This was common practice in the pre-accession period. Nominally, the process may be relatively longer, but at the same time smoother and reducing the burden on beneficiaries.

**64** It is very important that application forms are flexible and can be tailored to the specific profile of the RDI projects.

**65** The possibility to amend the project applications can, however, extend the duration of the project selection process.

**66** It is necessary to have in-depth knowledge of the project application to formulate complex requests for its amendment.

**67** For example: implementing schedule, indicators, and their target values or sources of own financial contribution.

descriptions of the planned activities,<sup>68</sup> which ultimately translates into more accurate project selection in terms of relevant criteria, including innovativeness. It should be particularly beneficial for SMEs, whose experience and level of skills required for preparing good applications will generally be less than those of larger entities.

- 3. Institutional setup.** Including three institutions (MA, IB1, IB2) in the selection process prolongs the overall procedure and contributes to its complexity. Organizing the entire project selection system on a one-stop-shop basis is therefore justified, meaning a single IB is fully in charge throughout the selection process and makes all decisions related to it.<sup>69</sup> This is common practice across the EU for many regional, national, cross-border, and transnational OPs having a single body (MA or IB) solely responsible for project assessment, selection, and contracting.<sup>70</sup>
- 4. Project assessment procedure.** Project assessment procedures can be time-consuming and resource intensive. For this reason, a key process-oriented change would be to reduce formal assessment as much as possible to an administrative check of the applications. A single/integrated eligibility check<sup>71</sup> should follow, and only after that should quality criteria be used for a score-based assessment of project proposals, leading to final selection and grant award.
- 5. Panel of experts.** The use of the panel of experts can increase the quality (relevance) of project assessment and selection, although it requires significant effort to coordinate the many external actors. For complex projects in the field of RDI, in particular, one step in the assessment might anticipate that applicants attend the expert panel meeting, respond to the panel's concerns, and modify the project accordingly, if necessary.<sup>72</sup> This helps the experts choose good projects, not just good applications. This approach could be a decisive factor for RDI projects, for which complex and complicated ideas can often be difficult to describe using standardized application forms.

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- 68** It should be noted, however, that RDI project applicants may have concerns about application confidentiality. This affects the quality of the descriptions they offer, which may be written in general, unclear terms so as not to reveal too much. Additional information and affirmations should be widely disseminated to make it clear to applicants that all confidentiality standards for submitted applications will be met.
- 69** At the same time, it is important to ensure better communication and day-to-day cooperation between the MA and IBs to allow regular exchange of experience and discussion on possible solutions to problems and improvements in the project selection system.
- 70** For example, in Poland, RDI projects are evaluated either through the National Centre for Research and Development for the countrywide Smart Growth OP or through regional development agencies in case of regional OPs.
- 71** The current solution used in the OPCC, with the eligibility of expenditures executed after the quality review, is counterproductive. It can lead to "undermining" high quality projects by cutting off some important costs at the later (eligibility) stage while offering limited possibility to reshape (modify or adapt) these projects.
- 72** Based on questions, comments, and suggestions from the experts, it should be possible to change the content of the application, including the eligibility (and relevance) of some expenses. If the panel wants to remove something from the project, it would first explain this to the applicant at the meeting.

**6. Pool of experts.** In view of the large scale of the tasks to be carried out by experts, creating a broad pool of experts is necessary,<sup>73</sup> including, if possible, foreign experts.<sup>74</sup> It would also be necessary to establish cooperation with scientific societies and to promote to them the benefits of participation in selection activities. Once the pool of experts reaches a critical mass, competition between them may appear, which is conducive to identifying the best projects and improving the overall quality of project assessment and final selections. Experts are needed especially where local knowledge is lacking and where the community is too small to include sufficient numbers of experts with no conflicts of interest. Wider involvement will be possible when the applications are available in English, which is the case in Poland but not in Bulgaria (Box 4.8).

## Box 4.8 Organizing pools of experts in Poland and Bulgaria



### Poland

Every national MA, regional MA, or IB can use external experts in the project selection (including appeals procedures) and project implementation processes (including control). To organize the use of experts, every institution sets up an extensive list of potential candidates. The list is open (on a rolling basis) and includes all interested persons who fulfilled predefined quality criteria and took part in the open calls. For example, as of the end of April 2020, the National Centre for Research and Development, acting as the IB responsible for implementing two out of five Priority Axes within the Smart Growth OP, maintains a list of 3,721 potential experts. Depending on their knowledge, experience, and availability, potential experts are indicated and contracted by an MA or IB to take part in a process stage, such as project assessment for a given call for projects. The contract with the expert could be purely transactional (for a specific service or dedicated work period) or have a framework-agreement character.

Project proposals are generally prepared in Polish. It is up to the body responsible for organizing a call for projects to decide on the exact shape and detailed content of application forms. For example, the National Centre for Research and Development, acting as IB, may request that applicants provide an executive summary of the project proposal in English.

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**73** RDI calls for projects are becoming so widespread that the selection of experts for panels is increasingly challenging, not only at national level but even across the EU. The availability of (good) experts is limited, inter alia because they conduct similar studies or have very limited time. National experts in particular find it difficult to avoid potential conflicts of interest in evaluating advanced research projects.

**74** Foreign experts are needed especially where local knowledge is lacking and the community is too small to find experts with no conflicts of interest. Their involvement is only possible when applications are available in English.

## Bulgaria



Some MAs have performed procurement procedures for employing external experts with specific expertise. The goal of those tenders is to create a pool of external experts with different profiles who can be used multiple times in the Programming Period for different calls under one OP. Through such tenders, if made at the beginning of the Programming Period, the MA can create a pool of experts that can later be used to supplement the evaluation commissions and the monitoring process (for calls requiring specific expertise).

Since all information is in Bulgarian and project proposals are submitted exclusively in Bulgarian, the MAs do not employ foreign experts for evaluation or monitoring processes. If such experts are wanted for a call, the MA must bear the costs of translation, accommodation, and other similar expenses.

Source: Staff elaboration.

**7. Quality of the work provided by experts.** Quality of expert work should be continuously supported by the respective IB. Training opportunities for experts should be widely available, including exchange of knowledge and experience among them as well as between them and MA/IB.<sup>75</sup> In addition, elaborating better instructions for experts for the respective calls for proposals would reduce the level of uncertainty during the assessment. In any case, quality check system for the work of external experts should be in place. The applicants should have no doubts as to whether such a system exists. Reviews done by experts should be characterized by well-structured argumentation, compliance with selection criteria, logical consistency, and order. At the same time, cooperation with experts should be interrupted by the respective IB when their work quality is poor.

### *After project selection: Concluding the contract*

- 1. Documentary requirements.** Beneficiaries should submit declarations at the application stage, and only after the selection of projects should the necessary documents be provided. Many formal issues must be verified and confirmed immediately before the contract is signed.<sup>76</sup>
- 2. Format of grant contracts.** Standardized grant contract content may not be very effective since types of beneficiaries and projects implemented by beneficiaries under OPCC can vary widely. Consequently (for example, in the case of RDI projects), the IB should be responsible for organizing a call for projects and contracting with beneficiaries

<sup>75</sup> Experts should take part in intensive interactive training sessions and discussions, based on case studies, where they analyze, for example, specific cases of challenging proposals.

<sup>76</sup> These include, for example, partnership agreements, detailed breakdowns of expenditures, or documents relating to state aid.

using grant award forms written from scratch. This would allow respective IBs to take full responsibility for the overall care of the beneficiaries and their projects.

- 3. Appeals.** Complaints should be managed flexibly. Different solutions could be applied depending on the specificity of the public intervention area. This might mean, for example, that RDI projects (under PA 1 OPCC) would have only one window at the end of award procedure to object. Whatever solution is adopted, it should be a common practice that managing complaints does not stop the clock so that complaints on project assessment and contracting do not cause wider delays. This rule has proven successful in EU countries (e.g., Poland) as well as in transnational programs (e.g., INTERREG Baltic Sea Region Programme covering eight EU member states).

### How can payment retardants be defeated?

**Modify thresholds for procurement obligations.** A tendering procedure for nonpublic entities (e.g., SMEs, NGOs) is described in CNR 5. The obligations are similar to those laid down in the Public Procurement Law.<sup>77</sup> Nonpublic beneficiaries should be given more freedom in their procurement, however. The general recommendation here is therefore to raise the financial threshold for the direct procurement rule to be followed. It is also necessary to simplify further the tendering system for nonpublic actors by creating a user-friendly, business-oriented, online bidding platform, which may use, for example, a reverse auction system. Much more hands-on assistance for beneficiaries would also be required (including better availability and quality of trainings).

## Box 4.9 Procurement procedures in Poland and Bulgaria



### Poland

Entities not subject to obligatory public procurement procedures (including private companies) must use a “rule of competition” above a net PLN 50,000 threshold (~EUR 11,000). This is a simplified procedure supported by the European Funds Competition Database, a dedicated online instrument. Every company supported by EU funds must publish requests for offers using this database if the expected value of ordered goods, services, or work exceeds the threshold above. The entire bidding procedure is open, rather smooth, and transparent. Selection of the contractor, with justification, is announced via the database. A report on the selection process is made available to all entities who provided an offer.

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<sup>77</sup> Following the CNR 5 guidelines could be especially complicated for RDI projects, for which the scope of procurement is not always easy. Another big risk seems to be possible financial corrections for noncompliance with the rules.

Generally, R&D projects supported under article 25 of the GBER are handled under the same conditions as other projects. According to national Guidelines on eligibility of expenditures under ESIF, however, there could be some extreme and clearly described exceptions when pure competition among bidders is not feasible. In seeking to benefit from these exceptions, written justification must be provided beforehand. One of these special cases is “the only-provider” situation. In such cases, it should be demonstrated that no other tenderer can perform the contract. Another exception to the competition rule is envisaged under Thematic Objective 1. With the prior approval of MA (in case of regional OP) or the National Centre for Research and Development (acting as IB for Smart Growth OP), and under specified conditions, it is possible for a beneficiary to contract a tenderer who is a so-called related party.

## Bulgaria

Private entities apply a simplified procurement procedure if the amount of the awarded grant is greater than 50 percent of the total amount of the approved project and the estimated value for:

- i. construction, including cofinancing by the beneficiary, is equal to or higher than BGN 50,000;
- ii. deliveries or services, including cofinancing by the beneficiary, is equal to or higher than BGN 30,000.

The simplified procurement procedure is called “public invitation,” and the entire process of publishing and evaluating offers is performed online through the management and information system dedicated to EU funds (UMIS). Beneficiaries receive proposals only online through UMIS. Both electronically signed documents and signed and scanned documents are allowed. The deadlines are far shorter in comparison with the procedures under the Public Procurement Law, which leads to faster awarding of the tenders: usually around 10 to 12 days. The beneficiary uploads the final decision awarding the tender in UMIS and sends it to all applicants via e-mail. There is no appeal procedure established so candidates who weren’t awarded grants cannot challenge the final decision even if they believe irregularities occurred in the evaluation process.

If the amount of the awarded grant is less than 50 percent of the total amount of the approved project, private entities are not required to run public procurements and can award the respective contract directly to an entity of their choice.

For private entities, no exceptions exist concerning use of the direct award of the tender (even for R&D projects under article 25 of GBER), unless it is under the threshold or the award of a contract to another person would infringe copyright or other intellectual property rights or exclusive rights acquired by law or administrative act. In such cases, the beneficiary must notify the managing authority in advance and can directly award the tender.

*Source:* Staff elaboration.



**Improve and simplify the payment request procedure to shorten the time needed to prepare payment claims and avoid delays in disbursing funds.** Such delays can lead to a loss of liquidity for beneficiaries and jeopardize the smooth implementation of the OPCC. If delays are caused by repeated comments from the respective IB, the following solutions could be considered: (i) reduce the number of documents (scope of information) to be attached and verified, (ii) make the deadline schedule for submission of payment claims more diverse,<sup>78</sup> (iii) introduce a one-off possibility for the IB to make new comments,<sup>79</sup> and (iv) decouple payments from approval of payment claims, so that payment could (conditionally) go to the beneficiary before requests are fully verified and confirmed.

**Facilitate changes to contracts.** The need for frequent changes in RDI project contracts could result from the projects' specific nature. For this reason, extending the catalogue of minor contract changes that can be made by the beneficiary without IB consent would be helpful. Examples of such minor changes include updating the implementation schedule without changing the final date and making minor changes in project staff. This move would reduce the number of annexes, which are time-consuming to manage.<sup>80</sup> Articles 22 and 24 in Annex 1 of CNR 5 could be then modified accordingly to elaborate this issue.

**Any delays in approving full payment claims and related interim project reports or the contract annexes will likely cause problems with final recipients' financial liquidity.** For smaller companies with poor access to other sources of financing, liquidity issues could lead to project termination. Hence, the "weakest" beneficiaries should be carefully identified and monitored to capture such situations early enough and to speed up their payments.

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**78** One option could be to construct the schedule for payment claims so as to link it to the contract date. All in all, the schedule should be as flexible as possible, especially for those who might experience liquidity problems.

**79** It means that new IB comments/questions to the same payment requests, which has been previously verified, should be forbidden for the sake of transparency and faster spending (payments) within the OPCC.

**80** Digital annexing of contracts and digital analysis of interim project reports could be also improved, resulting in significant time benefits for the IB and beneficiaries.

## 4.4 Practical guidance for addressing systemic issues

### **The administrative burden related to OPCC implementation in Croatia is relatively high.**

The time devoted to internal procedures<sup>81</sup> in MCS institutions seems long in many cases, which could mean relations with beneficiaries are suboptimal. Administrative burdens affect the efficiency and economic effectiveness of the OPCC and as well as project implementation. Risk aversion and overregulation can introduce inertia to the system. To avoid this, a high level of social capital and institutional capacity is needed. This requires long-term “investments” in changes to the management culture in MCS institutions. Improving CNR could be part of the solution, but it is not enough. The points raised below should be taken into account, especially when preparing Croatia for the next generation EU Cohesion Policy after 2021, with a special focus on RDI area.

### **Have good human capacities in place**

#### **Adequate human and organizational capacity must be provided to successfully handle the OPCC successor.**

This refers to all the institutions involved and all processes installed, including especially project selection and project implementation procedures. Staff turnover as well as significant changes and movements in the organizational structure of MCS institutions are key long-term problems hampering their operations.<sup>82</sup>

#### **MA/IBs and external experts should be part of a continuous improvement process.**

Several aspects of ESIF implementation depend on the competencies and attitudes of people working at MA/IBs and the experts engaged. Considerable efforts — long-term tailor-made training programs, investments into soft skills, attractive internship programs, etc. — are required to break down barriers such as fear of decision making, excessive meticulousness, and lack of a holistic approach.<sup>83</sup> In this regard, the financial resources available under Technical Assistance should be used in the smartest possible way. Further to this, excessive penalization of certain (even accidental) “clerical” offenses should be rationalized.

#### **Significant wage gaps between the public administration dealing with OPCC and the private sector should be avoided.**

Working conditions of the people dealing with ESIF implementation should be competitive to convince them to stay in public sector institutions as well as to give them possibilities for professional development. This needs to be balanced well, however, so as not to make working in the administration so advantageous and stable in relation to the private sector that civil servants do everything possible to

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**81** Examples of these time-consuming internal processes include IB 2 asking for IB 1/MA permissions, approval processes for several internal documents or instructions, confirmation of decisions taken at lower levels, requests for derogations, giving information “for the attention” (FAO), etc.

**82** It should not be acceptable, for example, to have too few project officers and too much fluctuation among them at the level of project assessment or project checks.

**83** Especially at the senior management level people are needed who do not stick to rigid solutions but remain open to testing unconventional, innovative approaches.



prove their usefulness and indispensability, which can lead employees to oppose process simplification and automation as a direct threats to their jobs.

### Find the optimal institutional set up

**Setting up a dedicated RDI government agency<sup>84</sup> that also acts as IB for the OPCC successor<sup>85</sup> will be very important to efficiently implement EU programs.** Also extremely important is creating all necessary conditions to attract and retain the best available staff.<sup>86</sup> If the new agency has a clearly defined, well-recognized area of intervention and is well organised, with a well-prepared team and well-established network of international contacts, it should be given more autonomy in operations, contributing to quality and efficiency in managing the RDI part of the OPCC successor.

**It is worthwhile to regularly carry out evaluations, including internal ones, of how the MCS works.** This should include thorough assessment of the applicants' and beneficiaries' experience with all aspects of OPCC implementation. These evaluations should trigger changes in the way the MA and IBs operate in the future (e.g., in efficiently organizing calls for projects) and could include a comparative analysis (e.g., every six months) showing some basic data on how different MAs/IBs deal with their own tasks (e.g., commitment/payments level, duration of project assessment and selection procedures, duration of the payment claim process, staff turnover, etc.).

### Engage stakeholders when preparing for the future

**The business and scientific community should be actively, widely, and permanently involved in preparing and implementing the OPCC successor (2021+), including the project selection system and criteria.** Their expectations (as taxpayers), experiences (as applicants or beneficiaries), and vision (as researchers, innovators, and employers) should be taken seriously and met to the extent possible.

**The business sector should be invited to contribute to most task forces/committees responsible for drafting and negotiations regarding the OPCC successor.** They should be asked to provide concrete proposals to improve OPCC implementation. It would be useful if the business sector created a kind of "watchdog" to deal with all crucial aspects of the OPCC and provide "on-time" solutions related to different long-term or ad hoc problems identified.<sup>87</sup> For instance, in Poland the largest and most important employers' organizations decided several years ago to become extremely active partners in ESIF implementation. They were able to build very strong teams covering almost all aspects

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<sup>84</sup> Since 2010, when the National Centre for Research and Development was set up, this solution has brought great benefits to Poland. Similar observations could be made for Sweden, where Tillväxtverket started operations in 2009.

<sup>85</sup> This might also mean a separate OP dedicated to smart growth (smart specialization) after 2021.

<sup>86</sup> These conditions include at least the following: a convincing and inspiring vision; robust, long-term institutional strategy and structure; competitive salaries; and a range of options for career development paths.

<sup>87</sup> Business sector involvement in these works should be partly supported from the Technical Assistance budget.

of Cohesion Policy intervention (not only support for the business sector or RDI). Their contributions have been well prepared, with strong and justified proposals, opinions, and assessments at every level of decision making in which they have been involved (mainly at the level of different MC and working groups).

### Take a reasonable approach to CNR

**The CNR should not embody unnecessary striving for excellence.**<sup>88</sup> It is never possible to build perfect procedures that anticipate every possible circumstance and implement EU law in every detail. The procedures generated by the CNR cannot avoid responsibility for suboptimal decisions by spelling out exactly what should be done in every possible situation. Such unnecessarily precise guidelines leave no room for solutions tailored to the specific contexts (for example, RDI) and create national-level red tape that generates interface problems with the EU Regulations.<sup>89</sup> On the contrary, the CNR should offer good practice guidebooks for key MCS actors, while at the same time giving them a degree of autonomy in decision making and associated risk taking.

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**88** CNRs contain many examples of overly elaborated details (very specific timing of the correspondence between institutions in the MCS, for example, or the exact design for answers to questions from applicants or beneficiaries).

**89** In Poland, for example, the “ultimate” power of National Guidelines led to unnecessary modifications to the effective system for project selection in the area of international research agendas. By imposing a unified (rigid) model for selecting assessment experts, the Guidelines prevented the use of people who could provide the best quality of work and who had previously been selected on an individual basis thanks to the broad international network of contacts used by the respective IB.

# 5 Recommendations



# Recommendations

**The framework used to develop these recommendations closely follows the theoretical framework of the Functional and Governance Analysis.** As elaborated in Section 1 (Methodology), effective innovation policies should be:

- I. Designed so that they address market and system failures, following a fully developed theory of change, adapted to the local context, with properly identified beneficiaries and stakeholders, clarity on the expected results, and a fully developed M&E plan;
- II. Implemented effectively and transparently, with reasonable practices related to calls, application and selection processes, adequate budgeting and resources, managerial practices, and execution of M&E plans;
- III. Coherent and complementary with other policy instruments and policies, with effective coordination between institutions; and
- IV. Consistent and predictable, to allow time for the desired impacts to take effect in a highly volatile and unpredictable innovation space.

**The recommendations presented are limited to the analysis presented in this report.** The purpose of this report is to assess, program by program, the functionality of each policy instrument and to pinpoint specific areas for improvement relevant to that. While the report is self-contained, its findings should not be considered in isolation. Rather, these recommendations are cumulative and complementary with the findings of the first report under the PER in STI. The "Analysis of the Quality and Coherence of the Policy Mix" (World Bank 2019) focused on the needs of the innovation policy system as a whole and the overall composition of public spending for STI, and its findings and recommendations remain relevant and valid.

**Recommendations are grouped into six priority areas.** The prioritization exercise considers (i) the size and importance of the programs facing issues, (ii) the payoff from introducing reforms, and (iii) the pervasiveness of suboptimal practices throughout the NIS. An additional filter for setting priorities was whether the recommendation contributes to increasing the efficiency in the use of ESIF funds in preparation for the next EU funding cycle. Table 5.1 presents a summary of priority areas and recommendations.<sup>90</sup> Each recommendation is associated with a level of relevance and a timeline. "Systemic" relevance is related to recommendations that require high-level systemic change and would have the most impact. Recommendations that are applicable at program level and affecting most institutions and/or programs are labeled "across programs", while those affecting individual programs are labeled "program-specific". In terms of timeline, recommendations are organized into three categories: long term, medium term, and short term. The timeline is related to the amount of time necessary to complete the recommendation rather than to start it. Short term recommendations could be completed within one year, medium

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**90** Based on the analysis presented in this report, the team provided advance inputs and recommendations for increasing the efficiency in the use of EU funds, in the context of the preparation of the Croatia COVID-19 Development Policy Operation (DPO). Some of these recommendations, marked with the asterisk symbol (\*), became prior actions and have already been implemented or partially implemented.

term ones between one to three years, while long term ones may take over three years. Ultimately, each institution is responsible for introducing changes within its own purview.

**The Croatian government has a window of opportunity to recalibrate its approach to RDI funding in the context of the 2021–2027 MFF.** The 2014–2020 MFF was the first ESIF funding cycle in which Croatia participated from the very start. Institutions and the NIS as a whole had to adapt quickly to accommodate a large inflow of funds for RDI and faced a steep learning curve. After experiencing some “growing pains,” the conclusion of the 2014–2020 MFF presents an opportunity to take stock of experiences and lessons learned, taking them forward to the next MFF. ESIF funds have been, and will continue to be, the largest source of RDI funding in Croatia for the foreseeable future. Hence, recommendations related to ESIF-funded programs are considered to be particularly important.

**Table 5.1** Summary of recommendations

	<b>PRIORITY AREA 1 POLICY GOVERNANCE AND COORDINATION</b>	<b>RELEVANCE</b>	<b>TIMEFRAME</b>
a	Use the National Innovation Council as a decision-making body for overcoming implementation hurdles faced by innovation programs	Systemic	<b>Long term</b> ●●●
b	Consider redesigning institutional arrangements for ESIF funding	Systemic	<b>Medium term</b> ●●○
c	Establish a specialized innovation agency	Systemic	<b>Medium term</b> ●●○
d	Strengthen coordination between MSE and MEEC	Systemic	<b>Short term</b> ●○○
e	Strengthen coordination and effective information sharing between IB1 and IB2 institutions in the ESIF management and control system	Systemic	<b>Medium term</b> ●●○
f	Empower program managers to take charge of the full program cycle	Across programs	<b>Medium term</b> ●●○
g	Develop a long-term plan for STI policy	Systemic	<b>Long term</b> ●●●
h	Establish long-term commitment to project funding from the national budget	Systemic	<b>Long term</b> ●●●
<b>PRIORITY AREA 2 PROGRAM DESIGN</b>			
a	Diagnose and target market failures	Across programs	<b>Medium term</b> ●●○
b	Consider alternative instruments for addressing market failure	Across programs	<b>Short term</b> ●○○
c	Mainstream the use of logic models	Across programs	<b>Short term</b> ●○○
d	Develop a full catalogue of inputs, activities, and administrative costs	Across programs	<b>Short term</b> ●○○
e	Revise program objectives	Program-specific	<b>Short term</b> ●○○

### PRIORITY AREA 3 INTERACTIONS WITH BENEFICIARIES

a	Commit to executing plans for regular publication of calls	Systemic	Medium term ●●○
b	*Reduce procurement burdens on beneficiaries	Across programs	Short term ●○○
c	*Fully digitize application, selection, contracting, and monitoring	Across programs	Medium term ●●○
d	Improve and simplify the payment request procedure	Program-specific	Medium term ●●○
e	* Increase transparency in the management system for ESIF funds	Systemic	Short term ●○○
f	* Increase scope of stakeholder engagement	Program-specific	Medium term ●●○

### PRIORITY AREA 4 SELECTION PROCESS

a	* Allow more flexibility in setting selection criteria for RDI projects	Across programs	Short term ●○○
b	Streamline the selection process	Systemic	Medium term ●●○
c	Adjust the project proposal review process	Across programs	Medium term ●●○
d	* Establish pools of experts for assessment of project proposals	Across programs	Short term ●○○
e	* Allow submission of project proposals in English	Systemic	Short term ●○○
f	Remunerate reviewers adequately	Systemic	Short term ●○○
g	* Streamline appeals procedures	Systemic	Medium term ●●○

### PRIORITY AREA 5 M&E DESIGN, IMPLEMENTATION, AND LEARNING

a	Develop M&E capacity and resources	Across programs	Long term ●●●
b	Revise indicators and fully integrate M&E systems	Across programs	Medium term ●●○
c	Use M&E data to inform decision making, learning, and adjustments	Across programs	Medium term ●●○
d	Develop program-specific evaluation plans	Program-specific	Medium term ●●○

### PRIORITY AREA 6 HUMAN RESOURCES

a	Invest in hiring, retaining, and training professionals specialized in innovation policy and financing	Systemic	Medium term ●●○
b	Expand systems for human resource analyses	Systemic	Medium term ●●○
c	Develop performance evaluation systems	Systemic	Long term ●●●

## 5.1 Policy governance and coordination

### The new governance of STI policy and financing set in place after Croatia's EU accession has encountered challenges related to ownership and coordination of the STI agenda.

While ESIF funds are the largest funding source in the STI space, they are not the only one. The full STI space appears to have no clear ownership behind it. Gaps in the policy mix identified in the "Analysis of the Quality and Coherence of the Policy Mix" (World Bank 2019), as well as frictions during absorption of ESIF funds, can be partly traced to fragmentation of the STI agenda, at both the strategic and the operating levels (see Section 4). The STI agenda could be supported at the operational level by a specialized innovation agency (see section 4.4). Planning the next generation of ESIF funding (2021–2027) presents an opportunity to incorporate the lessons learned in the 2014–2020 period, including by strengthening coordination between IB1 and IB2 and even redesigning the institutional arrangements for deployment of EU funds (see sections 4.3 and 4.4).

**Recommendation 1a** | Use the National Innovation Council as a decision-making body for overcoming implementation hurdles faced by innovation programs

<b>WHO</b>	MSE, MEEC, MRDEUF
<b>WHY</b>	Coordination and ownership of the STI policy agenda creates challenges. The composition of the council is such that it also serves as a platform for broader dialogue among institutions, academia, and industry. In this context, critical decisions must be reached to improve the implementation of ESIF for RDI.
<b>HOW</b>	Organize regular, structured discussions and coordination meetings regarding plans for STI policies and financing. As part of these discussions, once stakeholders present a case concerning implementation hurdles encountered, make decisions to remedy the situation.
<b>TIMEFRAME</b>	<b>Long term</b> ●●●

**Recommendation 1b** | Consider redesigning institutional arrangements for ESIF funding

<b>WHO</b>	MRDEUF, MSE, MEEC
<b>WHY</b>	The governance setup of STI funding is fragmented, with duties and responsibilities spread out across different institutions. This fragmentation reaches all the way to the program level, with many institutions involved in different steps of the process.
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Reconsider and rationalize MA consent power in operational matters.</li> <li>ii) Rearrange the selection process on a one-stop-shop basis. A single IB should be responsible for the whole selection process, making all related decisions.</li> </ul>
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**Recommendation 1c** | Establish a specialized innovation agency

<b>WHO</b>	Government of Croatia, MSE, MEEC
<b>WHY</b>	An innovation agency would eliminate fragmentation among the different institution in the STI landscape. Design and implementation of innovation funding requires specialized knowledge and expertise (see section 3.8). The agency could be a focal point to accumulate this expertise, which could then be used to perform specialized tasks, including market failure analysis, impact evaluations, and similar. This is particularly important because of fast-paced changes in demand and conditions, which require a high degree of autonomy and expert judgment rather than bureaucratic rule-following. It would also be more efficient to develop these skills in one agency, rather than to invest in developing them in each institution separately.
<b>HOW</b>	Reach a decision to establish an innovation agency with the appropriate mandate and resources. Depending on system readiness and willingness, the agency can be i) included in implementation at IB2 level, and/or ii) responsible for many aspects of designing programs and conducting calls and selection (based on guidance by line ministry). In any case, at the agency level, the two agendas (public and private) of the MSE and the MEEC should meet.
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**Recommendation 1d** | Strengthen coordination between MSE and MEEC

<b>WHO</b>	MSE, MEEC
<b>WHY</b>	The division of the STI agenda between public (MSE) and private (MEEC) creates inefficiencies, especially in the space where public and private agendas are supposed to meet. Programs that put academic institutions in the lead of programs aimed at commercialization or private R&D programs that do not cater to early-stage private sector research are examples of this. As two leading institutions in the STI agenda, MSE and MEEC should maintain frequent, systematic contact.
<b>HOW</b>	Engage in regular discussions to coordinate plans and exchange practices. Use an Interministerial Working Group to discuss issues at the program level, share experiences, and seek other institutions' views. Dedicate a slot in the agenda for showcasing the programs being implemented.
<b>TIMEFRAME</b>	<b>Short term</b> ●○○



**Recommendation 1e** | Strengthen coordination and effective information sharing between IB1 and IB2 institutions in ESIF management and control system

<b>WHO</b>	MRDEUF, MSE, MEEC, HAMAG-BICRO, CFCA
<b>WHY</b>	<p>ESIF funds are the largest source of funding for RDI in Croatia, but their implementation requires a high degree of coordination among institutions involved in the management and control system.</p> <p>IB1 and IB2 have agreements with the MA, but no contractual link joins IB1 and IB2. This could be a missed opportunity for management efficiency gains in areas of mutual interest.</p>
<b>HOW</b>	IB1 and IB2 should sign agreements between them regulating their mutual relationship, information sharing, and mutual obligations in the project proposal selection process. This would bring clarity and ownership to their collaboration and, ultimately, accountability for their performance.
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**Recommendation 1f** | Empower program managers to take charge of the full program cycle

<b>WHO</b>	MSE, MEEC, HAMAG-BICRO
<b>WHY</b>	Having a single point of contact for every program would facilitate coordination of program activities and would provide clarity regarding responsibility for the full program cycle, from design to results.
<b>HOW</b>	Appoint a single point of contact for each program. This should be an experienced professional in the area of STI policy who could take ownership of the full life cycle of a program.
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**It is important to make long-term commitment to STI policy and to articulate its strategic direction.** A long-term commitment to innovation policy is crucial for achieving results (see Box 2.1) and should be embedded in strategic documents that span multiple political cycles. The S3 has been one of the anchors of STI policy in recent years. The S3 covers only one aspect of policy, however, focusing on governance and funding for specific sectors. An overarching policy framework or plan is needed that would focus on structural issues that cannot be resolved solely through funding and to which policy-makers will adhere. This should include commitment to programs for research excellence and business innovation funded from the national budget, despite the availability of ESIF funding (see sections 2.2.2, 2.2.7, and 3.5). National budget funding can be a powerful tool complementing ESIF, as it allows for greater flexibility and can cover areas that would be difficult to finance with ESIF funds.

**Recommendation 1g** | Develop a long-term plan for STI policy

<b>WHO</b>	MSE, MEEC
<b>WHY</b>	The life cycle of research and innovation tends to be long, in some cases taking decades to achieve desired impacts on productivity and growth. Long-term commitment to STI policy that remains consistent through political cycles requires a clear and articulated strategic direction. This would create the conditions for better policy planning and accountability and provide a framework for business planning for all actors in the NIS. It would also serve to educate the political class on the factors necessary for successful innovation policies, thus ensuring stable political commitments.
<b>HOW</b>	MSE and MEEC, as leading STI policy makers, should articulate an overarching STI strategy and ensure that all stakeholders adhere to it.
<b>TIMEFRAME</b>	<b>Long term</b> ●●●

**Recommendation 1h** | Establish long-term commitment to project funding from the national budget

<b>WHO</b>	MSE, MEEC
<b>WHY</b>	Programs with successful track records should be continued and nurtured. For instance, programs such as PoC and UKF have been successful in the past. Yet, institutional commitment to and ownership of these programs appear to be uncertain, as the institutional memory of these programs dissipates. (For example, PoC has been taken up by MEEC for one round, but it only financed private sector projects.) Funding from the budget can be complementary to ESIF financing.
<b>HOW</b>	Embed STI policy instruments into medium-term budget planning. Ensure the stable political commitment necessary for innovation policies.
<b>TIMEFRAME</b>	<b>Long term</b> ●●●

## 5.2 Program design

**Program design is rarely informed by detailed diagnostics and often lacks serious consideration of alternative instruments.** The justification for government intervention is usually not sufficiently substantiated by correct identification of the intervention type, budget, and number of beneficiaries needed to make an impact (see sections 2.1.2 and 3.2). Instead of targeting projects with the highest innovation potential, programs often end up focusing on projects with the highest certainty of achieving predefined program outcomes (e.g., putting new products or services on the market). Risk aversion embedded in program design is incongruent with the purpose of public intervention in STI: to close funding gaps for R&D activities that face such a high degree of uncertainty that no private investor would be willing to undertake them. The issue of risk aversion particularly affects ERDF-funded programs, whereas programs funded from the national budget offer a greater degree of flexibility. Interventions typically default to grant schemes, although for some programs it would make more sense to consider lending, convertible loans, or combinations of grants and loans.

**Recommendation 2a** | Diagnose and target market failures

<b>WHO</b>	MSE, MEEC, HRZZ
<b>WHY</b>	<ul style="list-style-type: none"> <li>i) A good program design requires a sufficiently detailed diagnosis of the market or system failure that requires government intervention.</li> <li>ii) Further, an inherent risk aversion is embedded in program design, especially for ESIF-funded programs. The discovery process is by nature highly uncertain and nonlinear, however. Failures are part of the process of discovery and should be accepted as such.</li> </ul>
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Carry out sufficiently detailed diagnoses of the problems in the system to understand the causes of the observed symptoms. Carefully articulate justifications for each instrument early in the design phase.</li> <li>ii) Provide more funding for early-stage R&amp;D in firms, mitigating the risk of failure by building a diverse portfolio of projects. Use impact evaluation to provide evidence of the program's overall effectiveness, even if individual projects fail.</li> </ul>
<b>TIMEFRAME</b>	Medium term ●●○

**Recommendation 2b** | Consider alternative instruments for addressing market failure

<b>WHO</b>	MSE, MEEC
<b>WHY</b>	<ul style="list-style-type: none"> <li>i) Grant instruments are the dominant financing mechanism for public R&amp;D funding in Croatia, yet other mechanisms may be more effective in achieving program goals.</li> <li>ii) Alternative considerations are not limited to the mechanism of intervention, but also include different approaches to solving the same problem (e.g., to provide soft support). A good quality diagnostic should guide program design toward the most effective solution.</li> </ul>
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Consider updating ex ante assessment related to the use of ESIF financial instruments in the area of RDI.</li> <li>ii) When preparing a program, include an analysis of alternative options to address the market failure and provide a detailed explanation for the selected intervention. Consider the effect of the proposed instrument in the context of already existing instruments and those about to be implemented.</li> </ul>
<b>TIMEFRAME</b>	<b>Short term</b> ●○○

**Logic models are rarely used in program design, and their value has not been internalized.** Logic models are currently used only when required by funding partners, and the perception seems to be that they impose an administrative burden on program managers (see sections 2.1.6 and 3.3). The logic of the program is usually implicit and mostly focuses on outputs and outcomes, while inputs and activities are largely neglected (see sections 2.1.7 and 2.1.8). The lack of systematic approach to developing a program logic also affects the formulation of program objectives, which are either too broad or too narrow (see sections 2.14 and 3.4).

**Recommendation 2c** | Mainstream the use of logic models

<b>WHO</b>	MSE, MEEC, HRZZ, HAMAG-BICRO
<b>WHY</b>	Weak policy design often relates to mistaken assumptions about the context of an intervention, incorrect understanding of an intervention's effects, or failure to consider alternative instruments not typically used by policy makers. The logic model documents how an instrument is supposed to work, and its use can improve program design. Logic models provide a theory of change for the intervention, along with improved understanding of its effects, assumptions, and implementation risks.
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Develop a standard process for creating and updating logic models adapted to the Croatian context (both in terms of needs and in terms of available administrative capacity).</li> <li>ii) Build capacity for designing and using logic models by people and organizations engaged in the design and implementation of innovation policy.</li> </ul>
<b>TIMEFRAME</b>	<b>Short term</b> ●○○ Note: This work is already underway as part of Component 3 of the PER in STI.

**Recommendation 2d** | Develop a full catalogue of inputs, activities, and administrative costs

<b>WHO</b>	MSE, MEEC, HRZZ, HAMAG-BICRO
<b>WHY</b>	A logic model connects all resources (inputs) and activities required to achieve products (outputs) and results (outcomes). Having a full catalogue of inputs, activities, and administrative costs can help with realistic planning of resources.
<b>HOW</b>	<ul style="list-style-type: none"><li>i) Develop a full catalogue of inputs (including nonmonetary inputs) and activities needed to successfully implement a program.</li><li>ii) Develop a record of the administrative costs of running programs. This information can then be used to assess value for money, i.e., programs' efficiency in achieving outputs.</li></ul>
<b>TIMEFRAME</b>	<b>Short term ●○○</b> Note: Work on recording administrative cost is underway as part of Component 3 of the PER in STI.

**Recommendation 2e** | Revise program objectives

<b>WHO</b>	MSE, MEEC
<b>WHY</b>	A precise definition of objectives is necessary to gauge the success of programs. A well-formulated objective is a key element for developing the logic model and differentiating between short-term outputs and long-term outcomes.
<b>HOW</b>	Revise the objectives of instruments to (a) reflect the specific contribution of the program (MSE), and (b) improve the connection with higher-level systemic change in the economy (MEEC). Ensure that objectives are designed individually, going beyond the EU minimum requirements. Explicitly indicate objectives whose completion is conditional on performance of other public support instruments.
<b>TIMEFRAME</b>	<b>Short term ●○○</b> Note: This work is already underway as part of Component 3 of the PER in STI.

## 5.3 Interactions with beneficiaries

**Delays in publication of planned calls make funding unpredictable and inconsistent from the beneficiaries' point of view.** The analysis has shown that most programs have only one call, partly due to delays in the selection process (see sections 2.2.2, 2.2.7, 3.5, and 5.4). Lack of predictability would be easier to understand for programs funded from the national budget, as the national budget cycle operates on an annual basis. The situation in Croatia, however, is somewhat paradoxical: national budget programs for basic research run on a stable, predictable schedule, while ESIF-funded programs, which have a multiannual horizon, struggle with publishing calls on a regular basis.

### Recommendation 3a | Commit to executing plans for regular publication of calls

<b>WHO</b>	MSE, MEEC
<b>WHY</b>	RDI funding must be available at regular, predictable intervals over a long period of time. Changes in funding levels and availability over time create uncertainty that inhibits investment in research and innovation.
<b>HOW</b>	Establish a set call publication schedule consistent with the budget and purpose of the program. Large flagship programs (e.g., SIIF, STRIP, IRI) should publish calls regularly.
<b>TIMEFRAME</b>	Medium term ●●○

**Support programs are not easily accessible and impose high burdens on beneficiaries from pre-application to post-implementation.** Potential beneficiaries require more clarity about the process and the obligations that come with awarded funding. Public consultations involve only a subset of the call package, which contributes to beneficiaries' uncertainty. While the application process has moved from paper-based packages to electronic applications, some vestiges of the old system remain. For example, applicants are still required to print, sign, stamp, and upload application documents, and data is only partially searchable. During implementation, procurement rules have imposed a high burden on researchers and businesses alike. In addition, businesses can face liquidity crunches as authorities prefer to reimburse incurred expenses rather than directly paying invoices. The lack of experience and uncertainty around the issue of financial corrections has also taken a toll.

**Recommendation 3b** | Reduce procurement burdens on beneficiaries

<b>WHO</b>	MRDEUF, CFCA, HAMAG-BICRO
<b>WHY</b>	<ul style="list-style-type: none"><li>i) The fear of irregularities and concern about the deduction of funds and potential fiscal consequences are disincentives for public and private sector potential beneficiaries considering applying for funds. Often, these issues are also perceived as huge administrative burdens and as increasing transaction costs.</li><li>ii) Procurement rules for ESIF-funded projects impose a lower threshold for direct procurement (HRK 150,000) compared to the Public Procurement Law (HRK 200,000 for goods and services and HRK 500,000 for works). Firms cofinance expenditures of the project from their own resources, so they should not be held to a higher standard of procurement than that prescribed by the Public Procurement Law. Further, the regulations impose stricter safeguards against conflicts of interest than those prescribed by the Public Procurement Law.</li><li>iii) R&amp;D projects, which receive aid according to Article 25 of the General Block Exemption Regulation (GBER),<sup>92</sup> must go through the same procurement procedures as all other projects. This impedes procurement in R&amp;D projects and slows implementation. In R&amp;D projects, often only one source in the market can provide the specific equipment, material, or services required, and this provider may not be willing to participate in procurement procedures.</li></ul>
<b>HOW</b>	<ul style="list-style-type: none"><li>i) Provide beneficiaries with trainings and other forms of capacity building on procurement related matters. Provide ample, hands-on support in the procurement process. Prepare guidance, examples, and other materials to assist beneficiaries with the procurement process.</li><li>ii) Amend CNR 5 Annex 3 to align procurement thresholds with those recommended by the EC Directive. Further, adjust the request (in accordance to the Public Procurement Act) for a statement confirming no conflict of interest by stipulating that the document need only be signed once by one member of the beneficiary team and updated if circumstances change. Reduce the requirement so that only the representative of the nonpurchasing entity (enterprise) must confirm that no conflict of interest exists. Electronic signatures should be accepted.</li><li>iii) Allow all projects financed in line with Article 25 of GBER to use direct award in exceptional situations, with no limit on the amount of procured goods, subject to detailed and reasonable explanations provided by the beneficiary and accepted by IB2.</li></ul>
<b>TIMEFRAME</b>	<b>Short term ●○○</b> Note: Recommendations ii and iii were recently implemented based on early inputs from this work.

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**91** EU 651/2014.

**Recommendation 3c** | Fully digitize application, selection, contracting, and monitoring

<b>WHO</b>	MRDEUF, MSE, MEEC, HAMAG-BICRO, CFCA, HRZZ
<b>WHY</b>	Applicants are still required to print, sign, stamp, and upload application documents, and data is only partially searchable. This puts a bureaucratic burden on applicants, but also on program managers, who are unable to easily extract relevant information from project documents.
<b>HOW</b>	<ul style="list-style-type: none"><li>i) Allow electronic signatures in the process of application, selection, contracting, and monitoring.</li><li>ii) Amend CNR Rule 6 to state that documents used in the application process should include searchable formats. This should help reduce the time needed to evaluate project proposals.</li></ul>
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○ Note: Both recommendations i and ii were recently implemented based on early inputs from this work.

**Recommendation 3d** | Improve and simplify the payment request procedure

<b>WHO</b>	MRDEUF, MSE, MEEC, HAMAG-BICRO, CFCA
<b>WHY</b>	Authorities have been relying on cost reimbursement mechanism, particularly for private sector beneficiaries. In the cost reimbursement method, the beneficiary pays for a good or service within the project and then files a reimbursement claim with intermediate bodies. This process can strain the liquidity of beneficiaries, especially if invoice verification is delayed or clarifications are required. Currently, advance payments are possible only after beneficiaries provide a debenture or an advance payment guarantee.
<b>HOW</b>	<ul style="list-style-type: none"><li>i) Facilitate advance payments for beneficiaries. Due to high cost of advance payment guarantees for beneficiaries, consider using a debenture as collateral more often and for larger amounts of advance payment.</li><li>ii) Facilitate the use of the simplified cost option (SCO) to reduce the administrative burden and simplify compliance checks for both beneficiaries and IBs. Provide best practice examples to illustrate the advantages of SCO.</li></ul> <p>If delays in payments are caused by repeated comments from the IB, the following solutions could help:</p> <ul style="list-style-type: none"><li>(a) reduce the number of documents (scope of information) to be provided,</li><li>(b) make the deadlines for submission of payment claims more flexible (e.g., tie them to contract signing dates),</li><li>(c) introduce a one-off possibility for the IB to make new comments, and</li><li>(d) decouple payments from the approval of the payment claim, meaning that payment could (conditionally) go to the beneficiary before a request is fully verified and confirmed.</li></ul>
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○



**Recommendation 3e** | Increase transparency in the management system of ESIF funds

<b>WHO</b>	MRDEUF, MSE, MEEC
<b>WHY</b>	<ul style="list-style-type: none"> <li>i) Transparency is the key element for solidifying the partnership and trust between authorities and beneficiaries. Currently, the CNR, which laid down the operational guidelines for implementing ESIF funds, are not available to the broader public, nor are additional clarifications from the MA issued to IBs.</li> <li>ii) Changes to the CNR prior to their adoption would benefit from having the views of and inputs from other institutions in the management and control system.</li> <li>iii) Rules on eligibility of expenditures require further transparency. The Rulebook on eligibility of expenditures is broad and subject to interpretation, which may create confusion among institutions and beneficiaries. The Rulebook also has the status of government ordinance, which is difficult to amend.</li> </ul>
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Publish the CNR on the official webpage for ESIF funds: <a href="https://strukturnifondovi.hr/">https://strukturnifondovi.hr/</a>. Use the same webpage as a central point for publishing instructions, opinions, and interpretations of the CNR provided to IBs by the MA or other bodies with power to impose rules (ARPA, etc.).</li> <li>ii) Disseminate all proposals for changes to the CNR to IBs for comments before their adoption.</li> <li>iii) Create a more granular and easier to change CNR on eligibility of expenditures.</li> </ul>
<b>TIMEFRAME</b>	<p><b>Short term</b> ●○○</p> <p>Note: Recommendation ii was recently implemented based on early inputs from this work.</p>

**Recommendation 3f** | Increase scope of stakeholder engagement

<b>WHO</b>	MRDEUF, MSE, MEEC, HRZZ
<b>WHY</b>	<ul style="list-style-type: none"> <li>i) The public consultation process currently covers only the Guidelines for Applicants, leaving other integral parts of the call uncovered (e.g., detailed selection methodology).</li> <li>ii) More practical support is necessary to increase the quality of submitted projects (see section 4.3).</li> <li>iii) Stakeholder engagement and interactions are important for adequate determination of eligible costs. Authorities may not anticipate the importance of certain cost categories and the practical implications of their exclusion (e.g. overheads, travel expenses, etc.).</li> </ul>
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Cover all integral parts of the tender documentation (i.e., selection criteria and methodology) in the public consultation process.</li> <li>ii) Provide project preparation support by producing guidebooks, organizing workshops, etc. The focus should be on practical matters such as detailed information on how projects are assessed, most challenging issues in project preparation, most common mistakes, how to find the best fitting support program for a given project, and so on.</li> <li>iii) Use stakeholder feedback to adapt program elements, especially practical ones such as eligible costs.</li> </ul>
<b>TIMEFRAME</b>	<p><b>Medium term</b> ●●○</p> <p>Note: Recommendation i was recently implemented based on early inputs from this work.</p>

## 5.4 Selection process

**Lack of flexibility in setting selection criteria hampers the functionality of ERDF-funded programs.** The selection criteria should be continuously verified and adjusted to create a better environment for the most desired and valuable projects. The criteria should not be set in stone but rather should be seen as a management tool and changed as needed. Having a single set of criteria for the entire OPCC is suboptimal (see section 4.3). Evaluating RDI projects requires a different lens for each program. Further, due to a risk-averse attitude toward spending public resources, some criteria set a higher value on projects with a weaker rationale for market failure (see section 2.1.11).

**Recommendation 4a** | Allow more flexibility in setting selection criteria for RDI projects

<b>WHO</b>	MRDEUF, MSE, MEEC
<b>WHY</b>	The CNR prescribe ten categories of selection criteria that may be used for quality assessment. Each specific criterion must be integrated into one of the general criteria defined for the call. The criteria are not necessarily coherent with the justification for government intervention, which should focus on projects with a high degree of uncertainty instead of proximity to the market. Moreover, standardized criteria for the entire OPCC, in the absence of standardized beneficiaries and types of projects, makes limited sense and does not leave much space for reacting to changes in the wider OPCC implementation context.
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Amend CNR 6 (Grant award), point 7.1.2, to allow the IB1 more freedom in defining the methodology for assessing the quality of projects.</li> <li>ii) Specific criteria should be allowed as stand-alone criteria. IB1 should be empowered to define criteria, after which the proposed selection criteria must be confirmed by the Monitoring Committee, which gives the MA and other bodies space to provide their views.</li> <li>iii) The key selection (quality) criteria should be treated as an important management tool. Hence, it should be feasible to adapt them smoothly to the changing OPCC implementation context. Some upgrades in selection criteria can be discussed and decided as often as every Monitoring Committee meeting. All the improvements should be based on experience from earlier calls for projects as well as on the advancement of the OPCC.</li> </ul>
<b>TIMEFRAME</b>	<p><b>Short term ●○○</b></p> <p>Note: Recommendations i and ii were recently implemented based on early inputs from this work.</p>

**The selection process is an important area for improvement in many programs.** Some of the largest and most important ERDF-funded programs suffer from extended selection processes that, in some cases, can take years to complete (see section 2.2.4). The top priority for the 2021–2027 programming period should be to speed up the selection process by streamlining it and enhancing its agility. The selection process should be allowed more flexibility, accommodating the complexity of RDI projects that may not be easy to convey using standardized application forms (see sections 4.2 and 4.3). The most important programs funding basic research also have room for improvement (see section 2.2.4). National panels in HRZZ programs were set up to emulate the structures of the most prestigious funding scheme at the EU level: ERC and national science foundations in other European countries. This form, while it works well in other contexts, may not work as well in situations with a limited pool of experts.

**Recommendation 4b** | Streamline the selection process

<b>WHO</b>	MRDEUF, MSE, MEEC
<b>WHY</b>	<ul style="list-style-type: none"> <li>i) The selection process would benefit from a more streamlined approach, not only to reduce the number of stages but also to allow more flexibility in dealing with applicants. Currently, some aspects of eligibility are verified before quality assessment (applicant, partner, activity) and others after quality assessment. The applicant may do very well at the quality assessment stage, but still remain uncertain regarding financing. A program’s budget is an important aspect that may affect the substance of the proposal. It is therefore suboptimal to determine the project budget after assessing the quality of the proposal.</li> <li>ii) Further, programs impose substantial documentation burdens on applicants. Streamlining this aspect of the selection process would help not only beneficiaries, but also program managers, as the volume of documentation for review could drop significantly.</li> </ul>
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Adjust the selection process by defining three main stages: (a) administrative (admissibility) check; (b) eligibility check (including applicant, partner, activity, and expenditure); and (c) feasibility/quality check (including decision on grant award). The selection system should be continuously monitored and adjusted to create better conditions for supporting the best fitting projects. Adhere to project selection deadlines and collect and publish information on the duration of application assessment for each program.</li> <li>ii) Documentary requirements for applicants should be minimized as much as possible. Certain documentation could be provided later in the selection process, prior to signing contracts.</li> </ul>
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**Recommendation 4c** | Adjust the project proposal review process

<b>WHO</b>	HRZZ, MRDEUF, MEEC, MSE
<b>WHY</b>	<p>Certain parts of the review process currently in place can be reconsidered. Namely:</p> <ul style="list-style-type: none"><li>i) For HRZZ programs, the substance and novelty of project ideas are arguably the most important elements of project proposals in basic research. The two-step approach in which the national panel acts as a filter for international peer review aims to prevent the advancement of proposals that are not deemed to have a strong principal investigator or to be scientifically sound. However, since innovativeness, feasibility, and research merit are evaluated only at the international peer review stage, the evaluation conducted by the domestic panel may inadvertently exclude novel ideas from consideration. The domestic panel is also involved in the final selection round. Given the endogeneity of the panels and the small research community in Croatia, this arrangement may raise issues of trust and the perception of conflicts of interest.</li><li>ii) For ESIF programs, new approaches to the review process can be tested for some programs. This may help program managers to identify the projects that best fit the program.</li></ul>
<b>HOW</b>	<ul style="list-style-type: none"><li>i) Administrative eligibility can be determined by HRZZ or a national panel, while the quality assessment should be done by an international panel.</li><li>ii) For ESIF programs, panels of experts could be used to review applicants' presentations of their ideas. This format would allow the experts to gain firsthand, in-person experience of the applicants themselves, going beyond review of materials. Moreover, other countries allow minor modifications in project applications based on the feedback from selection experts. This can increase the quality of the projects and potentially preempt certain implementation problems.</li></ul>
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**Recommendation 4d** | Establish pools of experts for assessment of project proposals

<b>WHO</b>	MRDEUF, MSE, MEEC, CFCA, HAMAG-BICRO
<b>WHY</b>	<p>Considerable time during the selection process is spent finding the right experts for selection panels. The process could be accelerated by ensuring in advance a pool of experts ready to fill a review panel and initiate the review process at short notice.</p>
<b>HOW</b>	<p>The practice of other EU member states (MS) but also of the European Commission (EC) permits engaging reviewers from a previously established pool of experts (see section 4.3). While the recent changes in the CNR introduce the possibility of a pool of experts, the institutions involved have yet to employ this in practice. When seeking external experts, the IB1/IB2 should independently decide if it is possible to specify full details of the subject of procurement, depending on the nature of the call (especially relevant for the RD1 calls). IB1/IB2 should have flexibility and easy access to the pool of experts, as this is one of the key bottlenecks in the selection process.</p>
<b>TIMEFRAME</b>	<b>Short term</b> ●○○ Note: This recommendation was recently implemented based on early inputs from this work.

**Recommendation 4e** | Allow submission of project proposals in English

<b>WHO</b>	MRDEUF, MSE, MEEC
<b>WHY</b>	<p>According to the CNR, all project proposals must be prepared exclusively in the Croatian language. Finding experts with the necessary competencies and experience in frontier or niche fields of RDI is already challenging. Requiring that reviews be conducted in Croatian further limits the pool of potential reviewers. Conflicts of interest are the main concern in a small country such as Croatia. In some programs, delays in the selection process were caused by the failure to procure experts, mainly due to conflicts of interest.</p> <p>Requesting that applicants prepare at least part their project applications in English would enable IBs to engage non-Croatian-speaking reviewers with adequate experience and knowledge.</p>
<b>HOW</b>	The MA should amend CNR Rule 6 to allow IB1s to request that applicants submit project proposals in English and that project reviews be fully or partially conducted in English. The IBs, each in its own area of competence, should determine whether the call requires the involvement of foreign experts in the selection process.
<b>TIMEFRAME</b>	<b>Short term ●○○</b> Note: This recommendation was recently implemented based on early inputs from this work.

**Recommendation 4f** | Remunerate reviewers adequately

<b>WHO</b>	MREDUF, MSE, MEEC, Government of Croatia
<b>WHY</b>	Adequate remuneration to peer reviewers would help with procuring experts in specific fields. Currently, the decision on the amount and method of compensation for work in councils, committees, working groups, and other similar bodies (hereinafter, the "Decision") limits the compensation of peer reviewers to HRK 150 per report.
<b>HOW</b>	Amend Section IV paragraph 3 of the Government Decision to permit more competitive remuneration of reviewers in the selection process.
<b>TIMEFRAME</b>	<b>Short term ●○○</b>

**Recommendation 4g** | Streamline appeals procedures

<b>WHO</b>	MRDEUF, MSE, MEEC
<b>WHY</b>	<ul style="list-style-type: none"><li>i) Applicants may submit appeals at each step of the selection process, which creates a significant burden on the Appeals Committee. Appeals put a heavy burden on the MA as well, which must go into the details of the call context or practical problems related to assessing applications in the many areas covered by the OPCC.</li><li>ii) In certain calls, when an applicant files an appeal, the selection process is blocked and cannot move forward. This can happen at any stage of the selection process, which further slows down the award of funds.</li></ul>
<b>HOW</b>	<ul style="list-style-type: none"><li>i) The appeals process may be reorganized by allowing the IB organizing the call to address the appeal in the first instance.</li><li>ii) Rationalize the appeals process. One way to do this would be to limit the number of complaint “windows” (for example, the end of the assessment procedure) or by defining thresholds for submitting appeals (for example, a minimum number of points).</li><li>iii) Once an appeal is filed, it should not block further assessment of other projects.</li></ul>
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○ Note: Recommendation iii was recently implemented based on early inputs from this work.

## 5.5 M&E design, implementation, and learning

**M&E systems are underutilized in learning and decision making.** On the design side, Croatia's M&E systems focus more on monitoring and tracking outputs, with little measurement of outcomes and impacts (see sections 2.1.14 and 3.9). Post-closure data is rarely collected and analyzed. This makes it difficult to use the data for the primary purpose of M&E: learning and adjustment. No programs studied here envisaged or made provisions for an impact evaluation. The implementation side also shows inefficiencies in parallel M&E systems (see section 2.2.13).

### Recommendation 5a | Develop M&E capacity and resources

<b>WHO</b>	MSE, MEEC, HAMAG-BICRO, HRZZ
<b>WHY</b>	High quality M&E design and implementation requires appropriate incentives and specialized units with sufficient technical capabilities. It may also require temporary hiring of highly qualified experts to conduct rigorous impact evaluations.
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Provide training for specialized M&amp;E units focused on impact evaluations and their interpretation.</li> <li>ii) Set aside resources for hiring technical experts for impact evaluation on an as-needed basis.</li> </ul>
<b>TIMEFRAME</b>	<b>Long term</b> ●●●

### Recommendation 5b | Revise indicators and fully integrate M&E systems

<b>WHO</b>	MSE, MEEC, HAMAG-BICRO, HRZZ
<b>WHY</b>	The current M&E information system is only partially useful to program managers, as it lacks certain indicators and disaggregations. As a result, intermediate bodies have had to establish parallel, offline monitoring systems, which require additional work to maintain and introduce the possibility of errors.
<b>HOW</b>	<ul style="list-style-type: none"> <li>i) Revise and rationalize indicators used in the M&amp;E systems of programs to include standardized output, outcome, and impact indicators and disaggregations as well as process indicators. (This is already underway as part of Component 3 of the PER in STI.)</li> <li>ii) Make the online M&amp;E system fit for purpose to minimize manual data compilation.</li> </ul>
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**Recommendation 5c** | Use M&E data to inform decision making, learning, and adjustments

<b>WHO</b>	MSE, MEEC, HAMAG-BICRO, HRZZ
<b>WHY</b>	Currently, M&E systems appear to focus on administrative monitoring, with limited input into future programs.
<b>HOW</b>	Incorporate results from procedure monitoring to adjust program implementation and the design of future programs.
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**Recommendation 5d** | Develop program-specific evaluation plans

<b>WHO</b>	MSE, MEEC, HAMAG-BICRO, HRZZ
<b>WHY</b>	Lack of proper counterfactual evaluation prevents attribution of high-level impacts to any single program. Impact evaluation results could be used to advocate for continuing a program, making adjustments, or cancelling a program altogether.
<b>HOW</b>	Select a few key programs as candidates for impact evaluation. Engage an impact evaluation expert at the design stage to ensure that proper methods and data collection systems are in place. Avoid accumulating many evaluations at the same time to maintain the quality of the evaluation.
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○



## 5.6 Human resources

**One reason for program dysfunction is insufficient investment in human resources.** After reshuffling the institutional landscape for STI policy, much of the capacity that had been developed was dissipated. The present fragmentation of the STI system (both between and within programs) reduces ownership over program results. Institutions face high turnover, as public administration offers limited incentives and uninspiring career development prospects (see sections 2.2.10 and 3.8). Effective implementation of ESIF funds requires highly skilled, sufficiently autonomous staff who are empowered to make decisions and adapt to circumstances, rather than focus on bureaucratic requirements (see section 4.4). Although available, training opportunities are underutilized due to workload pressures.

**Recommendation 6a** | Invest in hiring, retaining, and training professionals specialized in innovation policy and financing

<b>WHO</b>	MRDEUF, MSE, MEEC, HAMAG-BICRO, CFCA
<b>WHY</b>	Managing STI support programs requires specialized knowledge and sufficient flexibility and autonomy to act in rapidly changing conditions. It often requires that staff make judgment calls relying on their experience and expertise. The success of institutions in the STI policy space depends on their organizational capabilities to recruit, hire, and cultivate capable staff.
<b>HOW</b>	<ul style="list-style-type: none"><li>i) Design human resource management systems to facilitate hiring, retaining, and training staff specialized in STI policy and funding. To attract and retain ESIF implementation staff requires competitive working conditions, and staff should be provided with possibilities for career and professional development. Increase the use of temporary hires for highly specialized tasks or demand surges.</li><li>ii) Develop mandatory long-term, tailor-made training plans for staff and external experts at all levels to keep staff up to date with latest developments and to provide attractive career paths for qualified employees. The master training plan could cover two to three years, translated into annual action plans. Use the financial resources available under Technical Assistance to enhance staff capabilities.</li><li>iii) Use an employment plan to manage internal staff relocations and promotions. The relocation option could be an innovative way to broaden and strengthen staff skills and competencies, opening up new possibilities for professional development.</li></ul>
<b>TIMEFRAME</b>	Medium term ●●○

**Recommendation 6b** | Expand systems for human resource analyses

<b>WHO</b>	MRDEUF, MSE, MEEC, CFCA, HAMAG-BICRO, HRZZ
<b>WHY</b>	<ul style="list-style-type: none"><li>i) Workload analysis examines employee practices to ensure appropriate staff for all tasks in each institution; however, it does not cover internal evaluation of task division among MA and IBs or take into account the efficiency of the OPCC and project implementation.</li><li>ii) The Organizational Development Strategy focuses on available and required administrative capacity, but it should also consider strategies for staff attraction and retention (career paths, incentives, etc.).</li></ul>
<b>HOW</b>	<ul style="list-style-type: none"><li>i) Extend workload analysis to internal assessment of the task division among MA and IBs.</li><li>ii) The Organizational Development Strategy should consider different options for employee incentive schemes and career paths as well as key assumptions about making long-term employment in ESIF administration attractive for current and future staff.</li></ul>
<b>TIMEFRAME</b>	<b>Medium term</b> ●●○

**Recommendation 6c** | Develop performance evaluation systems

<b>WHO</b>	MSE, MEEC, HAMAG-BICRO, HRZZ
<b>WHY</b>	Effective staff policies include merit-based reward systems. Employees should be incentivized to improve their job performance continuously.
<b>HOW</b>	To the extent possible in light of remuneration rules in the public sector, link career incentives, pay raises, and bonuses to employee performance.
<b>TIMEFRAME</b>	<b>Long term</b> ●●●

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# Appendices

# Appendices

## APPENDIX I. List of programs covered in the Functional and Governance Analysis

	FULL NAME	SHORT NAME
1	Science and Innovation Investment Fund	SIIF
2	Strengthening Capacities for Research, Development, and Innovation	STRIP
3	Centers of Research Excellence	CoRE
4	Investments into Organizational Reform and Infrastructure of the RDI Sector	RDInfra
5	Enabling Synergies with HORIZON 2020 Initiatives for Spreading Excellence: Twinning and ERA Chairs	SYN
6	STEM Scholarships	STEM
7	Unity through Knowledge Fund	UKF
8	Research Projects	IP
9	Installation Research Projects	UIP
10	Tenure Track Pilot Programme	TTPP
11	Croatian-Swiss Research Programme	CSRP
12	Young Researchers' Career Development Project — Training of Doctoral Students	DOK1
13	Support to Researchers for Applying to ERC Programmes	ERC
14	Partnership in Research	PAR
15	Cooperation Programme with Croatian Scientists in Diaspora "RESEARCH COOPERABILITY"	PZS
16	Increasing the Development of New Products and Services that Result from Research and Development Activities	IRI
17	Support for Development of Centers of Competence	CEKOM
18	Development of Business Infrastructure	BSO
19	Business Services for SME through Business Support Organizations	BSO-Serv

20	Innovations in S3 Areas	S3
21	Reaching Markets through Product Certification	Cert
22	Introduction of Systems of Management of Business Processes and Quality (ISO and similar norms)	ISO
23	Innovation Vouchers for SMEs	Vouchers
24	Quality Labels	Quality
25	Increasing Competitiveness and Efficiency of SMEs through ICT	ICT2
26	Innovations in Newly Established SMEs	New-SMEs
27	Internationalization of SMEs through Business Support Organizations	BSO-Intl
28	Internationalization of SME Operations	Intl
29	Commercialization of Innovations in Entrepreneurship	Comm
30	Technology Transfer Office Support Program	TTO
31	"B-Light"—Fostering Value Added Business Cooperation between SMEs Operating on Different Sides of the Hungary-Croatia Border	B-Light
32	Eureka	Eureka
33	Eurostars	Eurostars
34	Proof of Concept Program	PoC
35	ITI System of Startup Incubators — Rijeka ITI Development of Business Support Organizations — Split	ITI
36	Croatian Venture Capital Initiative	CVCI



## APPENDIX II. Definition of areas assessed in the Functional and Governance Analysis



DESIGN	
ORIGIN	Degree of formality in the instrument origination process, together with information about continuity with previously implemented programs. Linkages with strategic objectives relevant to a particular policy area.
JUSTIFICATION	Quality of underlying diagnosis and its fit to a specific instrument. Reference to market failures as problems that justify interventions. Scope and robustness of quantitative analysis performed to determine assumptions of proposed activity.
RELATIONSHIP WITH POLICY MIX	Consideration of an instrument with regard to all other related instruments. Identification of potential conflicts, complementarities, or overlaps.
OBJECTIVES	Existence of explicit objectives and goals that connect an instrument to desired higher-level systemic changes. Degree of measurability and achievability of stated objectives.
CHOICE OF INSTRUMENT	Presence of analysis and justification for use of instrument compared to other possible instruments (ideally based on comparative criteria such as efficiency and effectiveness, cost-benefits ratios, and context appropriateness) to eliminate market failure.
LOGIC MODEL	Quality of model representing how an intervention is supposed to work, including how inputs, activities, and outputs lead to outcomes and impacts.
INPUTS	Degree of formality in planning inputs, including administrative and operational costs. Inputs should be consistent with the logic model and include all resources needed to achieve objectives.
ACTIVITIES	Explicit and complete list of activities. Consistency between inputs, activities, and outputs (e.g., all activities have a purpose and can produce desired outputs).
OUTPUTS	Explicit and complete list of measurable outputs, consistent with activities. Outputs are understood as necessary stepping-stones toward desired results.
BENEFICIARIES	Alignment of identified beneficiaries with instrument logic. Groups of beneficiaries identified to maximize program success (beyond generic demographic categories), with explicit targeting criteria provided.
SELECTION CRITERIA	Consistency with instrument objectives. Existence of selection mechanism to capture the target population with potential higher impact. Mechanism is transparent, simple, and easy to understand.
AUDIENCES	Complete list of stakeholders, excluding direct beneficiaries, expected to receive spillover benefits of an instrument. Identification of proper methods of interactions with them.
RESULTS AND IMPACT	Alignment an instrument's logic and connection to the system level. Identification of outcomes and impacts with observable and measurable results and specified indicators for assessment. Existence of criteria for tracking the evaluation of the program. Degree of connection between impacts and broader R&D strategy of the country or region.
MONITORING AND EVALUATION DESIGN	Quality of the M&E system and its integration into an instrument (i.e., as a baseline for future impact assessments). Quality of indicators and data collection methods.

IMPLEMENTATION	
LEARNING	Process of identifying and implementing changes to improve instrument performance. Degree of formality in documenting learning processes.
CALLS	Methodology for planning new calls for proposals not specified during the design stage; justification of new calls. Consistency of number of calls with the instrument's logical framework and objectives.
APPLICATION INFORMATION	Efficiency of established criteria in reaching target population and mechanisms for its ongoing modification. Transparency of criteria and public availability of information about applicants (to degree allowed by general privacy regulations).
APPLICATION PROCESS	Speed, transparency, and responsiveness of mechanisms used for application processing. Quality of experts responsible for project selection, their degree of independence, and transparency of their recruitment. Mechanisms for appeals and conflict resolution.
INFORMATION MANAGEMENT	Quality of database system that tracks participants, projects, follow-ups, outputs, and other components of an instrument. Usage of collected information to adjust solicitations, increase responsiveness to participants' concerns, and contribute to general improvement in program management and design.
FINALIZING AND FOLLOW-UP	Presence of comprehensive completion/closing report on both the instrument and the beneficiary level. Quality of post-closure communication and scope of information gathered after completion required to measure impact.
BUDGET ADEQUACY	Adequacy of budget and financial resources for full implementation of an instrument. Financial accountability mechanisms in place, including for subcontracted entities.
PROGRAM MANAGEMENT	Organizational structure enabling effective flow of information and minimization of external and internal pressures during program implementation. Presence of a high-quality performance review system with appropriate indicators.
AUTONOMY	Clarity in defining roles within implementing bodies, with procedures to introduce changes. Degree of flexibility in management structure to respond to significant challenges and resolve conflicts.
STAFF AND TRAINING	Adequacy in level of training and experience of managers, together with quality and number of staff. Existence of training and contracting tools to improve staff quality.
INCENTIVES	Presence and use of clear, explicit criteria for assessing staff performance, with linked awards and consequences for poor performance.
PROCESS MONITORING	Quality of internal process monitoring system, with clear indicators. Application of information from monitoring system to maintain the quality of management. Effective procedures for sharing data with higher authorities.
MONITORING AND EVALUATION IMPLEMENTATION	Continuity of M&E system operation and procedures for adapting and improving indicators over time. Presence of impact assessment system and revision based on its results.





GOVERNANCE	
RELATIONSHIP BETWEEN INSTRUMENTS	Degree of competition, communication, and integration with related instruments. Mechanisms to resolve overlaps.
RELATIONSHIP BETWEEN INSTITUTIONS	Quality of coordination mechanisms with related public and private institutions. Documentation in design process of cooperation with other institutions.
RELATIONSHIP WITH OTHER POLICY FRAMEWORKS: AWARENESS AND ADJUSTMENT	Type and scope of actions undertaken to leverage positive or mitigate negative factors resulting from regulatory constraints. Knowledge of legal environment related to functionality of an instrument. Adaptive actions regarding instrument possible within regulatory limitations.
RELATIONSHIP WITH OTHER POLICY FRAMEWORKS: SEVERITY OF LIMITATIONS AND MODIFIABILITY	Degree to which general legislation leverages or inhibits an instrument's impact and possibilities for modifying such obstacles.

### APPENDIX III. Good practice examples

**This appendix summarizes good practice examples for groups of categories that are functionally linked.** These examples may reflect either international best practices, or good practices observed in Croatia. The table below is organized into groups. For example, the M&E group encompasses M&E design, implementation and learning. A robust M&E system needs have properly designed indicators and data collection protocols, the system needs to be consistently implemented and well-integrated into the implementation processes, and it should be used to make ongoing adjustments, as well as provide a solid basis for learning at the overall program level.

<b>POLICY GOVERNANCE AND COORDINATION</b>	While there is no agreement on the ideal institutional arrangements for effective innovation policy, successful cases are those that adapt to local needs and context. For example, in Israel, a high level of awareness of a common nation-building agenda helped foster coordination of innovation policy across government. Having a centralized institution (Office of the Chief Scientist at the Ministry of Economy, now the Israel Innovation Agency) with a mandate to fund and coordinate innovation support was helpful in implementing policies and ensuring merit-based and quick allocation of funds.
<b>PROGRAM DESIGN</b>	<p>Innovation support programs in Israel invest in early stages of development, where there is no private sector interest and risk of failure is the highest. The risk of such investments is mitigated by diversification of supported projects – accumulating a portfolio of projects with sufficient critical mass such that the overall risk is reduced, even though individual projects may fail.</p> <p>In a few programs in Croatia, such as TTPP and CSRP, logic models informed the design of the instrument. Further, programs such as UKF and PoC are good examples with robust justification and appropriately set objectives.</p>

<b>INTERACTIONS WITH BENEFICIARIES</b>	<p>In Poland, the implementing body undertakes a series of activities to provide support to beneficiaries.</p> <p>In Israel, due to multi-decade commitment and consistent approach, programs are well known, limited in number, available every year and easy to plan around.</p>
<b>SELECTION PROCESS</b>	<p>At the international level, the Research Competitiveness Program of the American Association for the Advancement of Science (AAAS) is a best practice example for providing strategic assessment, peer review, training, and programs for innovation and entrepreneurship.</p> <p>In Israel, programs for high-tech start-ups have a reputable Investment Committee at the end of the selection process. If trust is low, the Committee should be comprised of foreigners only.</p> <p>UKF has a transparent and high-quality selection process of projects designed to avoid conflict of interest by engaging only international peer reviewers (three per project) who are experts in their field (peer review). According to a survey of beneficiaries, 86 percent of the research groups who were financed assessed the UKF evaluation and project selection system as excellent.</p>
<b>M&amp;E AND LEARNING</b>	<p>Having a robust M&amp;E system helped Israel maintain consistency in funding. A study of Israel's innovation programs showed a high return on investment on R&amp;D to GDP over a period of 20 years, which helped to advocate for the continuation of public funding.</p> <p>In Poland, the Agency for Enterprise Development developed a community of practice for M&amp;E with the aim of building local M&amp;E capacities. PARP organizes thematic workshops for innovation professionals and engages them in various activities. PARP also sends key staff to scientific and professional conferences, both in Poland and abroad, to maintain contact with the community.</p>
<b>HUMAN RESOURCES</b>	<p>Well-developed human resources require hiring and retaining staff with exceptional experience and high-quality educational background. Such examples may be found in Israel and Chile.</p>



## APPENDIX IV. Cluster analysis

- The functionality of Croatian STI support instruments varies depending on the managing institutions and areas of assessment; clustering analysis reveals clear patterns of performance.
- Areas related to beneficiary management and governance, stakeholder governance, and call management show heterogeneous performance, with some groups of programs overperforming and others underperforming. This leaves scope for peer learning within the NIS.
- Areas related to planning and learning, context formalities, and resource management underperform in most groups of programs, calling for a more systemwide effort.

**The Canberra distance was used for clustering of programs.** This method is often used for positive measures that do not range across several orders of magnitude and as such are close to the origin. Specifically, the measure is defined as:

$$d^{\text{CAD}}(i, j) = \sum_{k=0}^{n-1} \frac{|y_{i,k} - y_{j,k}|}{|y_{i,k}| + |y_{j,k}|}$$

where  $y$  represents the scores for cases  $i$  and  $j$  for variable  $k$ . The clustering algorithm was Ward hierarchical; that is, when assigning cases to groups it aims to minimize the internal variance of each group formed. The cut-off level for grouping instruments has been established at 6.25, which allows for clusters with some heterogeneity but that are still meaningful for identifying patterns.

**For the clustering of 31 management practice categories, correlation was used as a measure of proximity.** The same Ward algorithm was used to create the clusters. For categories, the cut-off level is 1.0, with range from 0.8 to 1.3 used for analyzing stability of results. The relationships across variables using correlation as similarity measure show how features of the policy instruments may co-vary in ways that mere logical classification might not reveal.

**Clustering techniques can be used to determine hidden patterns of performance and deeper connections across cases and practices.** The purpose of this exercise is to come up with a data-driven typology to simplify the analysis and recommendations. The analysis may, for example, confirm whether there are commonalities in scores based on the lead institution or funding source, and which sets of categories display some degree of similarity. The clustering was done separately at the level of programs and on 31 management practice categories, and the two results were then combined to reveal patterns across groups of programs and groups of categories. Programs may have common features across many categories that are rarely considered together when designing individual programs.

**The analysis produced two sets of groups: one across programs and the other across categories.** Table I presents the results of the clustering of instruments and categories.

**Table I** Clustering results: Instrument groups and category groups

INSTRUMENT CLUSTERING		CATEGORY CLUSTERING	
PROGRAM ACRONYM		CATEGORY NAME	CLUSTER NAME
BSO	<b>1</b>	Origin	<b>A</b> Context Formalities
BSO_Serv		Justification	
S3		Choice of instrument	
Cert		Jurisdiction interaction (internal)	
ISO		Portfolio relationship	<b>B</b> Beneficiaries Management and Governance
Vouchers		Beneficiaries	
Quality		Selection criteria	
ICT2		Eligibility and application information	
New_SMEs		Program database	
BSO_Intl		Program management	
Intl		Autonomy	
FILR		Jurisdiction interaction (external)	<b>C</b> Planning and Learning
SYN	Objectives		
CORE	Logic model		
RDInfra	Inputs		
CEKOM	Activities		
SIIF	Products outputs		
STRIP	Expected outcomes and impact		
STEM	M&E design		
DOK1	Learning implementation	<b>D</b> Stakeholder Governance	
B_Light	Process monitoring		
ITI_	M&E implementation		
TTO	Audiences		
ERC	Closures and follow-up	<b>E</b> Call Management	
Eureka	Programs relationship		
Eurostars	Institutions relationship		
PAR	Calls	<b>F</b> Resource Management	
IRI	Application and selection processes		
Comm	Budget adequacy	<b>6</b>	
IP	Staff and training		
UIP	Incentives		
PoC			
UKF			
PZS	<b>7</b>		
TTPP			
CSRP			

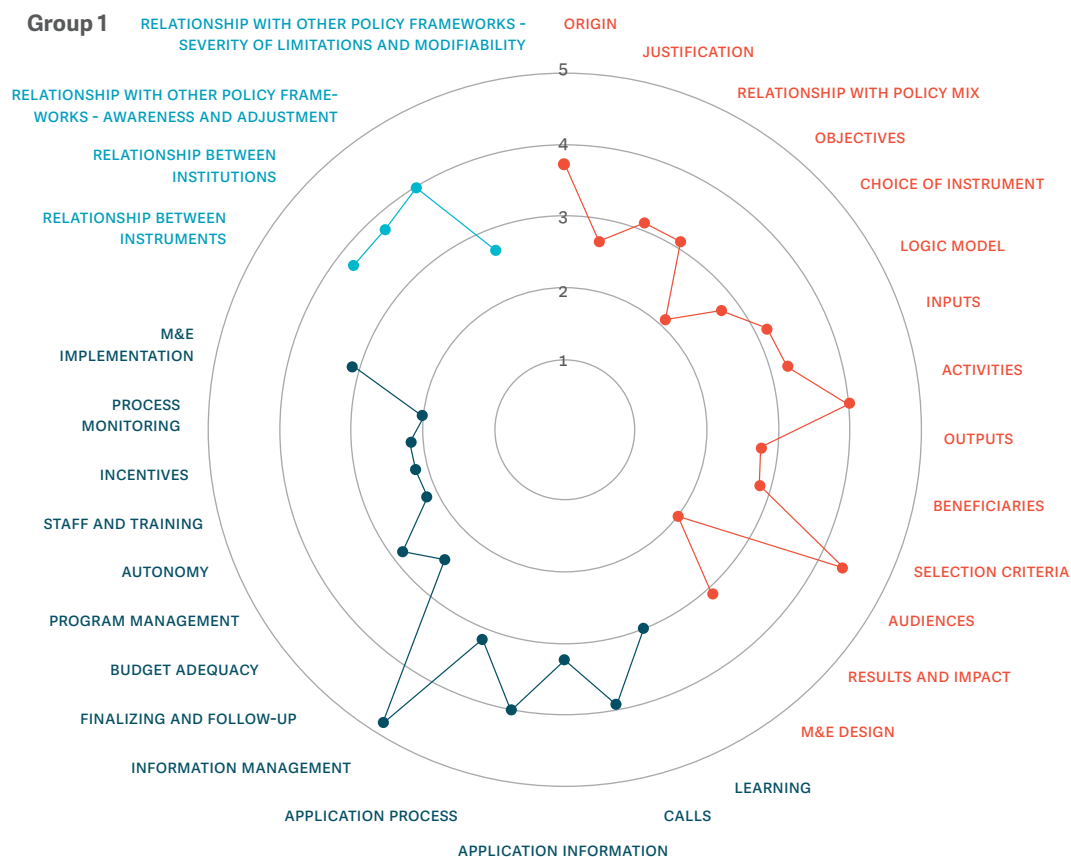
Source: Staff elaboration.

The same results are presented in the form of dendrograms in Figure VIII and Figure IX. In Figure VIII, programs are color-coded by lead institution and funding source, while in Figure IX categories are color-coded by area (design, implementation, or governance). The degree of similarity is measured by the length of the horizontal lines. Programs that are most similar to each other are directly linked by a vertical line (a node). For example, the scores in SIIF and STRIP are most similar to each other and thus they are directly connected through a node. TTPP and CSRP are also most similar to each other, but less so than SIIF and STRIP. A similar logic applies to the clustering of categories. Programs and categories that are joined together below the cutoff line form a group (that is, a cluster).

**The clustering process implemented at the category level yielded six groups:**

- A Context Formalities:** This group combines three categories from program design, namely, program origin, justification, and consideration of an alternative instrument, with one from governance, namely the interaction of jurisdictions as it relates to internal awareness and response. These are related in terms of the program's situation in the context in which it originates, and the justification and format of the intervention are defined. Much of this occurs according to rules given by the EC or national government, so it is unsurprising that it correlates with the governance dimension on the perception of jurisdiction interaction.
- B Beneficiaries Management and Governance:** This group includes eight variables from design, implementation, and governance. They include the relation with the policy mix and main beneficiaries in design; selection criteria, eligibility and application information, program database, organization quality, and roles of staff from implementation; and the constraining or enabling effect of interaction with other jurisdictions. These all reflect some connection to stakeholders of the program, both outside the agency (beneficiaries and audiences; external jurisdictions) and inside (staff roles and the management of beneficiary information).
- C Planning and Learning:** This group includes ten variables from design and implementation. Regarding design, it includes the logic model and almost all of its components plus program objectives and the status of monitoring and evaluation in the design. On the implementation side it includes implementing monitoring and evaluation and learning arrangements. The group clearly relates to the quality of planning, evaluating, and gathering lessons from assessment and experience.
- D Stakeholder Governance:** This group includes the definition of audiences in the logic model, the mechanisms and criteria for program closure, and coordination issues with other programs and institutions. Program closure relates indirectly to stakeholders given that it reflects one dimension of relations between program management and beneficiaries, which may potentially include differing expectations over what constitutes acceptable performance.
- E Call Management:** This group is simple, since it has the two variables that address the implementation of calls and the process of selection and approval of proposals.
- F Resource Management:** This group includes three implementation variables that cover the program's financial and human resources.

**Figure I** Areas for improvement for Group 1 programs include design and resource-related issues

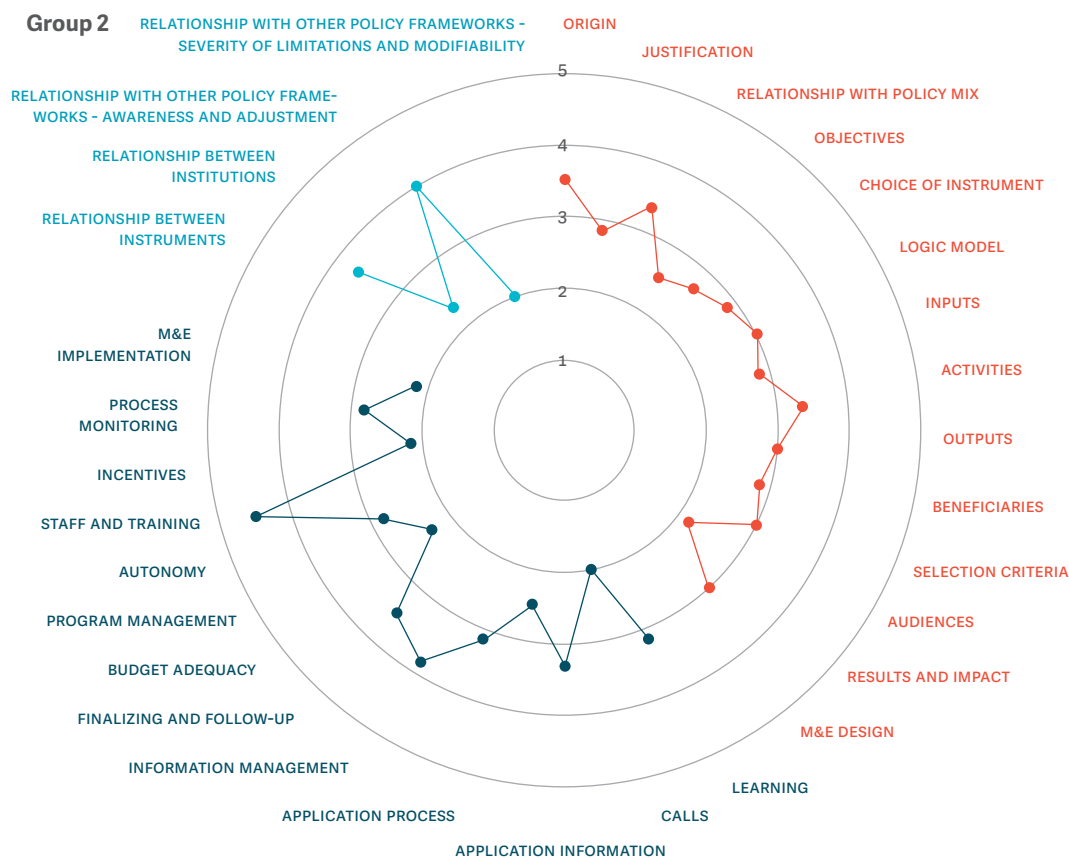


The clustering process implemented on the level of programs yielded seven groups.

**Group 1 includes programs cofinanced by ERDF and managed by the MEEC, which share some areas for improvement in the design approach (Figure I).** The composition of the group suggests a consistent pattern in design aspects across the institution. The reason may lie in rigid interpretations of EU regulations. Focusing on ensuring compliance with legal requirements during the programming period leaves limited space for elaborated consideration of certain design elements. The situation provides opportunities for improvements at the design stage, particularly in thinking about market failure and high-level project aims and targeting the optimal beneficiary group. Similar to other groups of programs, programs in Group 1 are also characterized by good practices in the area of call management and poor resource management.



**Figure II** Group 2 programs have challenges in terms of design, M&E, and institutional relationships

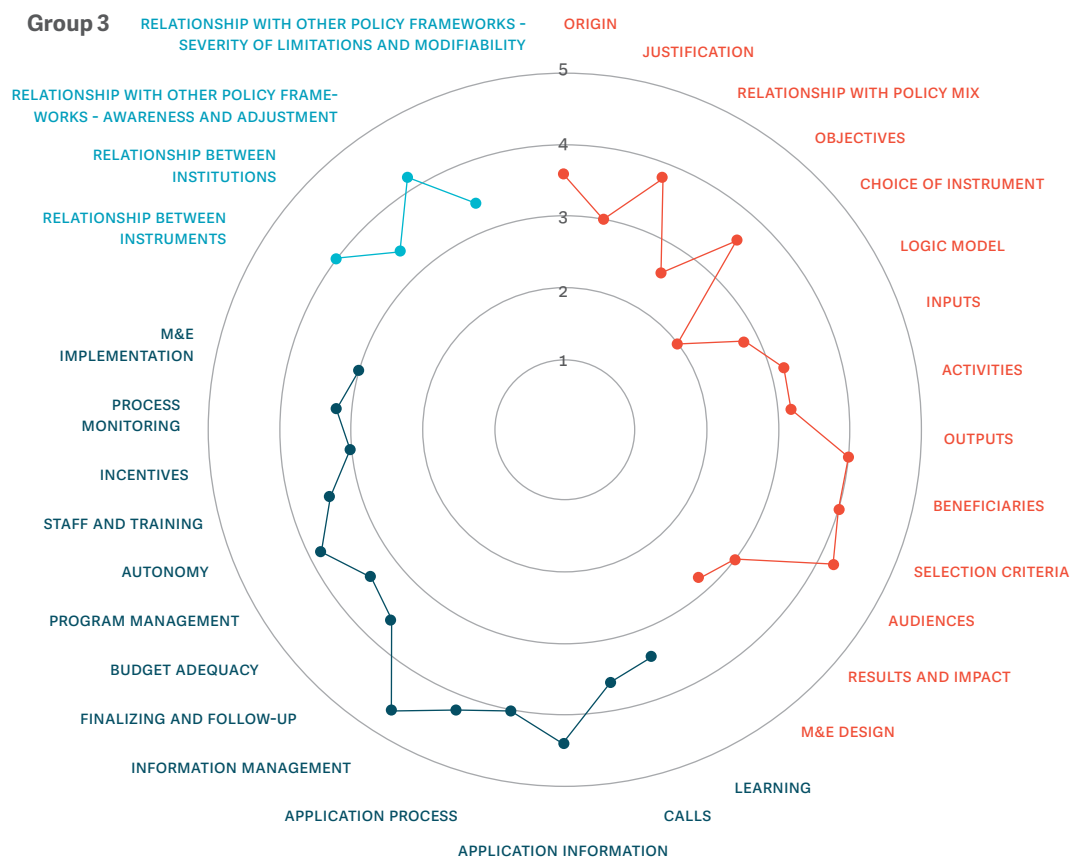


Source: Staff elaboration.

**Group 2 is a cluster of programs, mostly managed by the MSE,<sup>92</sup> that share clear institutional commonalities.** Design categories and learning process seem to be a common challenge for all MSE programs (Figure II). Establishment of these programs is backed by elaborate diagnoses and ex ante evaluations that concern conditions and features for their design. They mostly address symptoms rather than causes of the problems they try to solve, however. For example, a low number of publications by Croatian scientists is not in itself a system failure: it may (or may not) be a symptom of it. In addition, given the various reasons such symptoms might exist, alternative actions should be considered to address the problem. Programs in Group 2 also experienced some difficulties with their selection processes. On the other hand, most programs in this group excel in staff and training. The Croatian NIS is currently undergoing systemic transformation (related to broad introduction of project-based financing of RDI), which requires capacity building so that support programs will be relevant in the new set-up.

<sup>92</sup> Only one program in this group (CEKOM) is managed by MEEC.

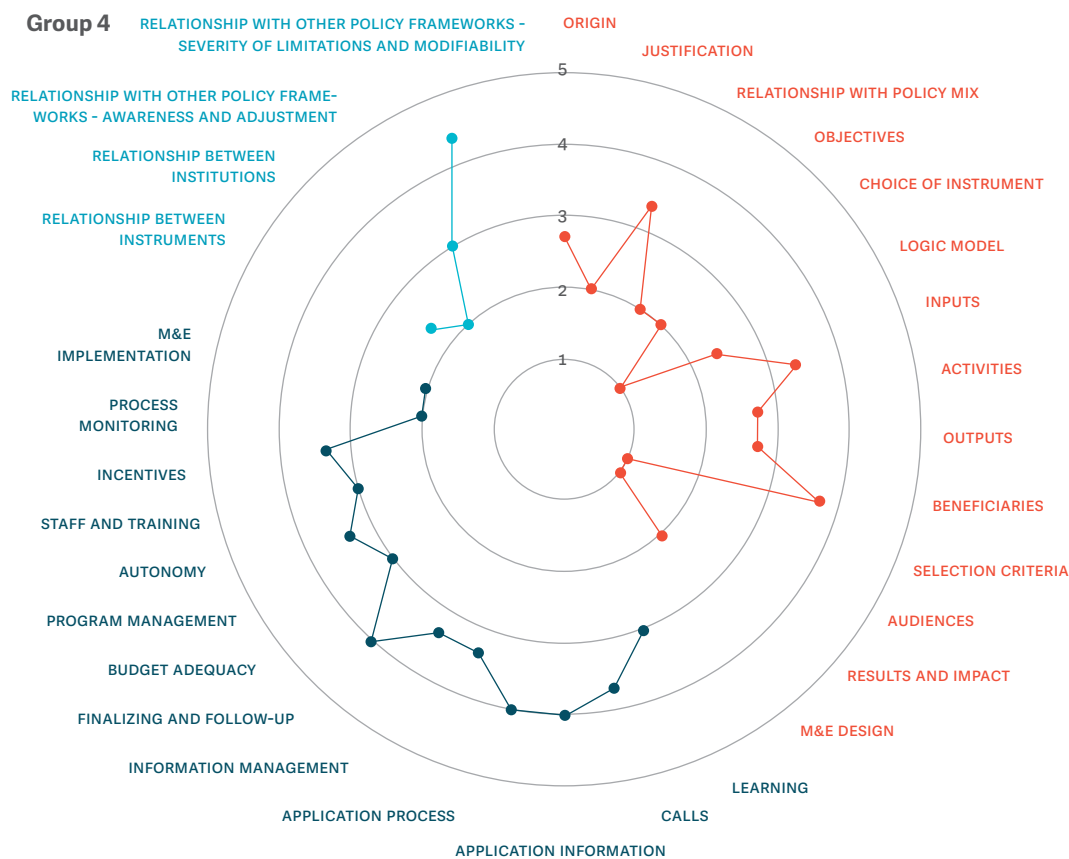
**Figure III** Group 3 programs have mixed performance



Source: Staff elaboration.

**Group 3 programs are heterogenous and have mixed performance.** The group is comprised of two distinct subgroups: STEM and DOK1, on the one hand, and B-Light, ITI programs, and TTO, on the other. The first two are both human resources programs and, although run by different institutions, are very similar. The remaining three are all geared toward some form of cooperation: academic-business (TTO), Croatia-Hungary business (B-Light), and local-business (ITIs). TTO and ITIs include some form of mentoring (this is, incidentally, also true of DOK1) and resemble each other more closely than they do B-Light (see dendrogram in Figure VIII). The programs are similar on groups of variables relating to stakeholders and call management (groups D and E). They are also very close on context formalities (group A) and learning and planning (group C) areas: relatively good on the first and equally mediocre on the second. TTO and ITIs are most similar on areas related to beneficiary management, planning and learning, and stakeholder governance (groups B, C, and D). This is not surprising given their mentoring aspect and new company focus. These two programs are fairly good at beneficiary management and stakeholder governance, but less good at planning and learning. B-Light matches the other two well on groups B and C (the reason it is included in this group), and it is a bit better than they are at resource management (group F).

**Figure IV** Areas for improvement in Group 4 programs are concentrated on the design side

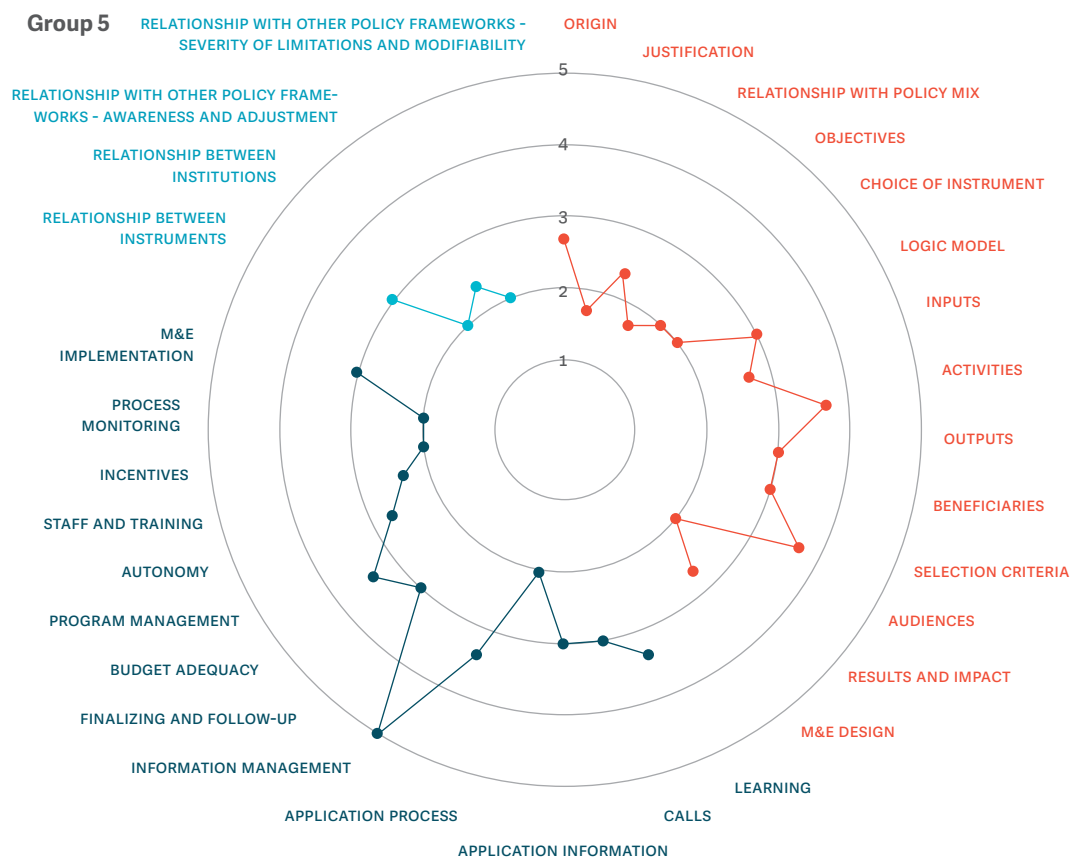


Source: Staff elaboration.

The two subgroups within Group 3, are most alike, on average, in terms of context formalities, beneficiary management, and stakeholders (groups A, B, and D). All programs are relatively successful in groups B and D but just middle of the road in context formalities. Some exceptions emerge in individual scores, but some variation is natural and doesn't negate the trends. These programs have some form of cooperation and mentoring included, so they are sensitive to beneficiary and stakeholder issues and do reasonably well on both counts. They all have challenges in planning and learning, however, like many Croatian programs.

**Group 4 includes Croatian editions of centrally managed pan-European programs.** These are Support to ERC applications, Eureka, and Eurostars. On the design side, the programs perform well in areas related to activities, identification of beneficiaries, and outputs, but they suffer from insufficient adaptation to the local context and integration into the rest of the policy mix (Figure IV). As discussed in Section 2, another issue for these programs may be lack of awareness of program design considerations.

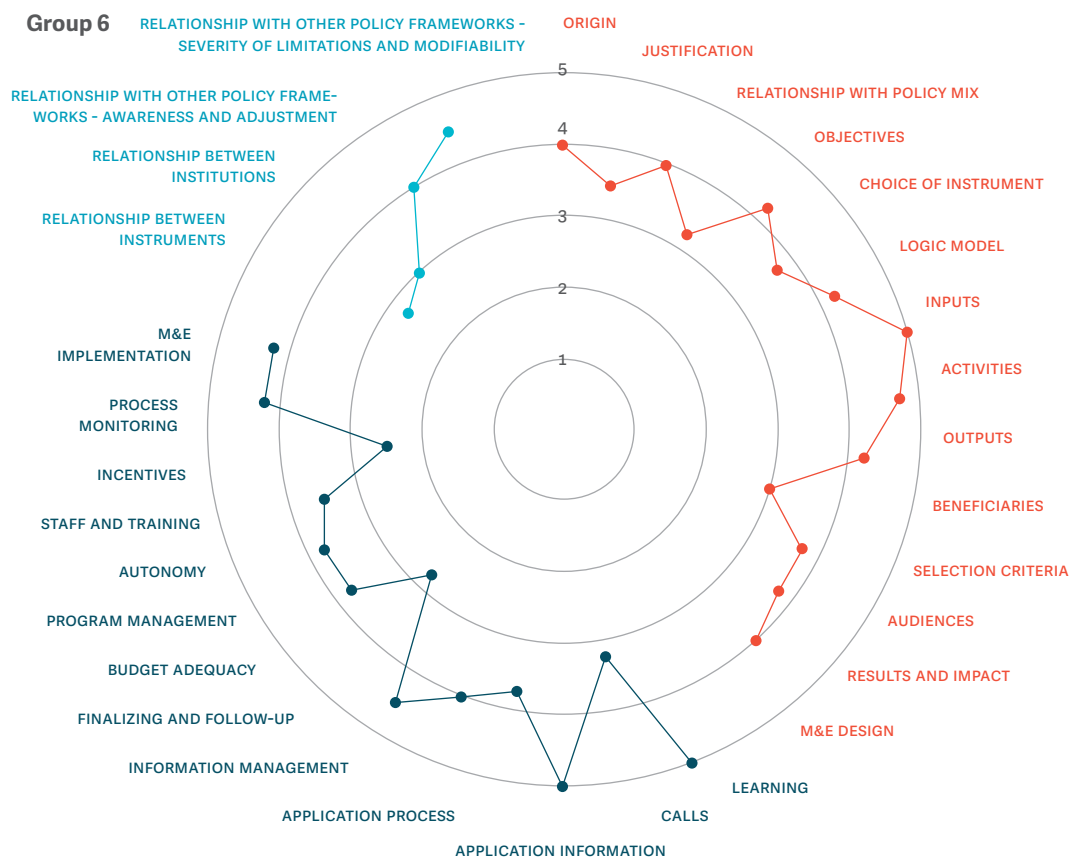
**Figure V** Group 5 programs have a lot of room for improvement



Source: Staff elaboration.

**Group 5 is also heterogenous, with many areas for improvement.** This group comprises PAR, IRI, and Commercialization. On the design side, the programs score low in most areas and are far from best practices (the average score was 2 or lower) in the areas of justification, program objectives, alternative instrument, logic model, and expected outcomes and impact (Figure V). As discussed in earlier sections, IRI and Commercialization support later stages of innovation, where the justification for government intervention is not as clear. The purpose of the PAR program is to stimulate private sector investment in research as well as public-private cooperation in research, but the design of the intervention was not informed by any specific market failure. On the other hand, all three programs do well (scores close to 4) in identifying outputs and in relationships with audiences. On the implementation side, one major area for improvement relates to the application and selection processes. As in other programs, IRI and Commercialization have had difficulties hiring appropriate review panels, and the selection processes lasted longer than the prescribed 120 days. In PAR, questions arose about the autonomy and endogeneity of the review panels, including about the identities of and low response from international reviewers, leaving the program vulnerable to cooptation by the local scientific community.

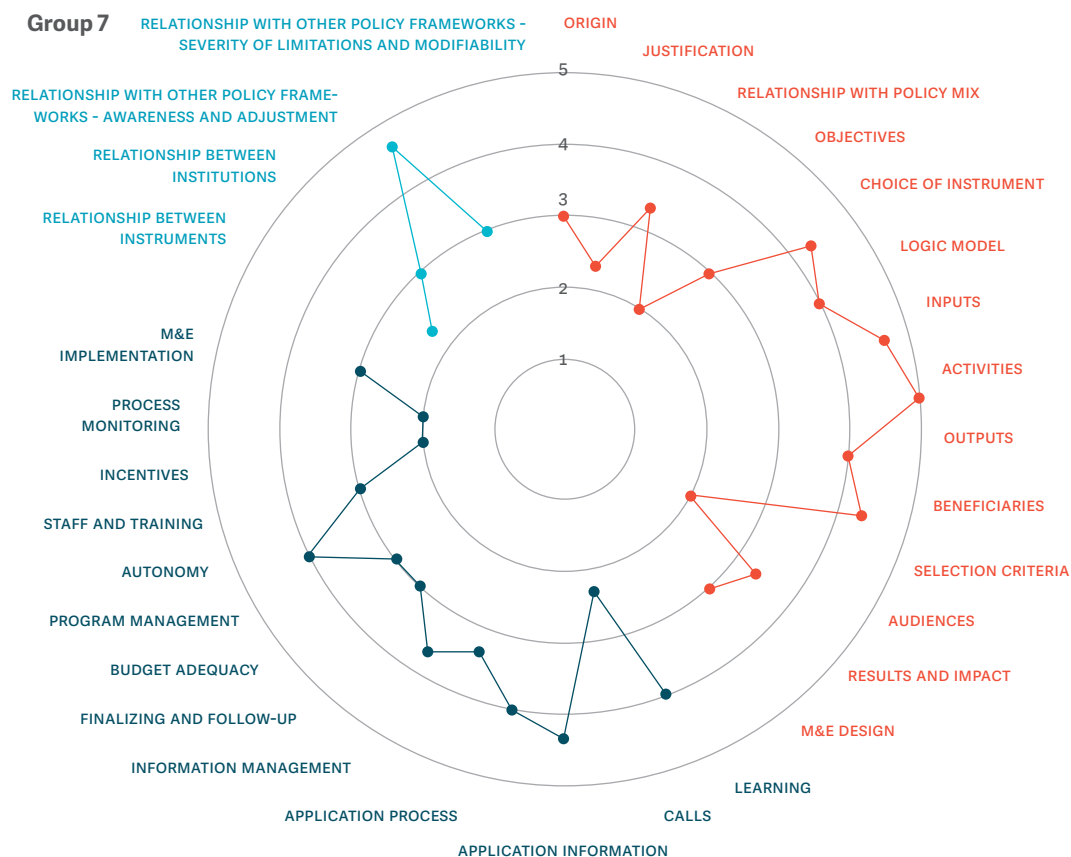
**Figure VI** Group 6 programs perform relatively well, with only a few weaknesses



Source: Staff elaboration.

**Group 6 consists of programs for basic research funded from the national budget, as well as programs funded by the World Bank.** This group includes IP, UIP, PoC, and UKF. This group performs well in all areas of program design, with an average score of 3 or higher (Figure VI). These are well-established programs that have been running regularly for several years (except for UKF, which had some discontinuity in calls for proposals). The programs do exceptionally well at identifying and cataloguing activities, learning and adjustments, and eligibility and application information. Major areas for improvement are few, but they include budget and financial resources, staff incentives, calls, program relationships, and institutional relationships. As discussed in previous sections, the continuation of funding for UKF and PoC has been uncertain. Moreover, in the case of UKF, the budget was insufficient to support all qualified projects, and it was unable to publish enough calls to achieve a more significant contribution to the program objectives. Group 6 performs well in almost all groups of variables except resource management (group F). An interesting feature of the programs in this group is that three of them are funded from the national budget and one is funded by the World Bank. Unlike programs established under the multi-institutional setup characteristic of ESIF support, these programs may suffer less from bureaucratic difficulties.

**Figure VII** Group 7 programs have well-developed logic models



Source: Staff elaboration.

**Group 7 consists of three programs managed by the HRZZ to support international research collaboration.** The Group 7 programs — PZS, TTPP, and CSRP — are outward-oriented and aim to establish connections with research initiatives abroad. These are the only interventions in Croatia designed using logic models. The design of PZS, TTPP, and CSRP benefits from comprehensive development of all aspects of the logic model, including a complete catalogue and accounting of inputs, activities, unlike other analyzed instruments, which focus mostly on the components on the right of the logic model: products and outputs. Concerning design aspects, however, these programs fell short in terms of origination, justification, and stakeholder involvement in the design process (Figure VII). Instruments in Group 7 also benefit from a well-structured learning process, which enables program managers to introduce meaningful adjustments during the implementation period. Dissemination of knowledge on the above aspects of program design within the HRZZ would be easily achievable.

**Mapping groups of instruments against groups of categories reveal further insights into what may be general patterns of better practices and practices in need of improvement.** Table 3.2 shows the ordered result with higher averages to the upper left and lower ones to the lower right; that is, the groups of instruments are in rows with decreasing overall average scores. The groups of variables are in columns with decreasing average scores from left to right.

**Table II** Two-way clustering of instruments and variables

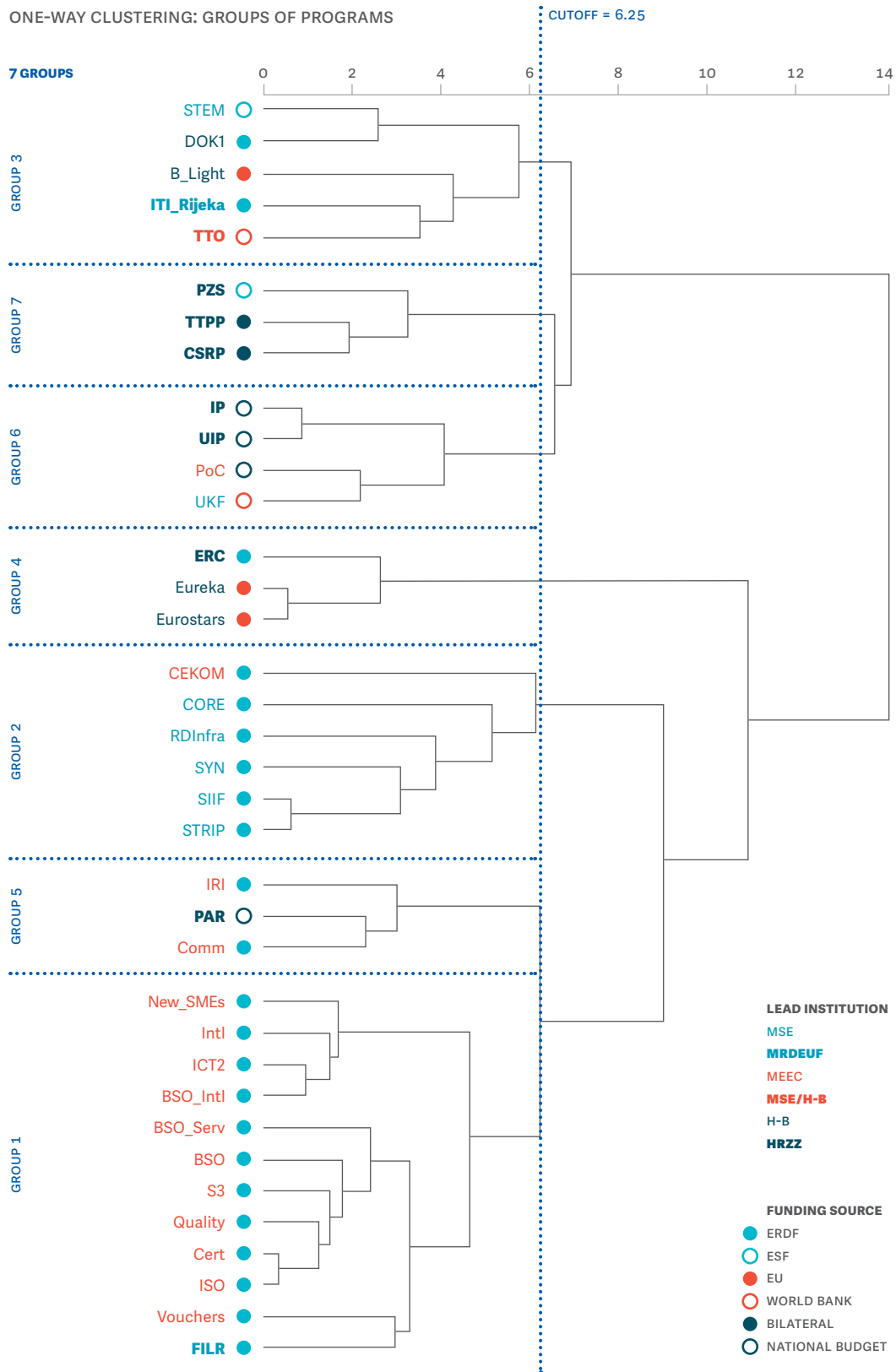
	6	3	1	7	2	4	5	AVERAGE FOR AREAS
B. Beneficiaries Management and Governance	4.03	3.88	2.84	3.67	2.85	3.46	2.83	3.37
D. Stakeholder Governance	3.5	4.05	4.17	2.75	3.21	2.17	3.42	3.32
E. Call Management	3.5	3.8	4.04	3.17	2.25	3.83	2.5	3.3
A. Context Formalities	3.69	3.35	3.38	3	3.21	2.42	2.08	3.02
C. Planning and Learning	4.33	2.9	2.84	3.48	2.8	2.13	2.63	3.02
F. Resource Management	2.92	3.33	2.28	2.67	3.39	3.44	2.44	2.92
Average for program clusters	3.66	3.55	3.26	3.12	2.95	2.91	2.65	

- AVERAGE SCORES OF 3.5 OR ABOVE
- AVERAGE SCORES OF AT LEAST 3 BUT BELOW 3.5
- AVERAGE SCORES OF AT LEAST 2.5 BUT BELOW 3
- AVERAGE SCORES OF 2.5 OR BELOW

Source: Staff elaboration.

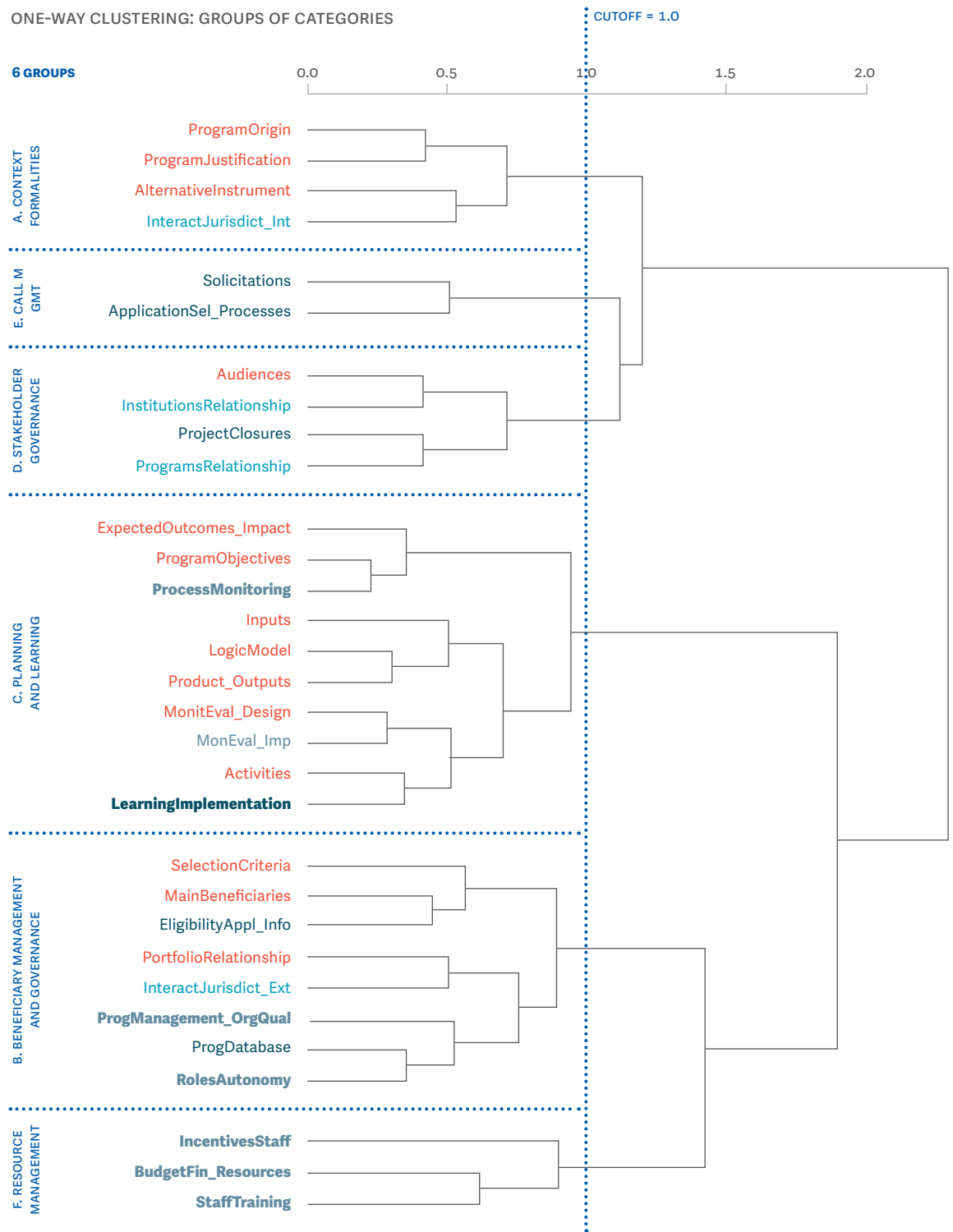
**In general, Croatian programs exhibit a clear pattern of overperforming and underperforming areas.** Many programs perform well on groups of categories related to beneficiaries' management and governance (group B), stakeholder governance (group D), and call management (group E). At the same time, many programs have problems with planning and learning (group C) and resource management (group F). If the Croatian government focused on improving performance in these two important aspects of innovation policy management, the benefits would be significant for the entire system.

**Figure VIII** Dendrogram of program groups





**Figure IX** Variable clustering dendrogram



SECTION 1. DESIGN      **SECTION 2.1 IMPLEMENTATION: Learning and Adjustments**      SECTION 3. GOVERNANCE

SECTION 2.2 IMPLEMENTATION: Program Implementation Mechanisms

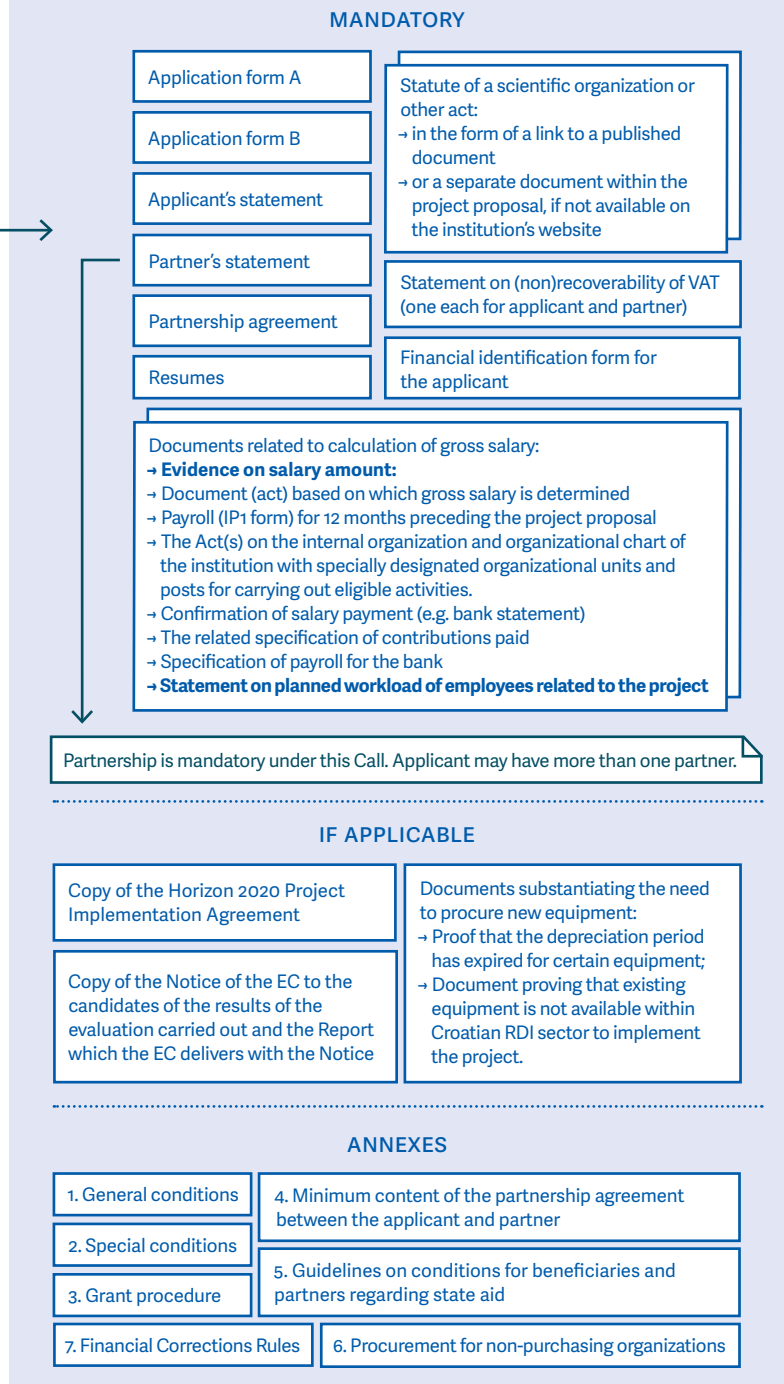
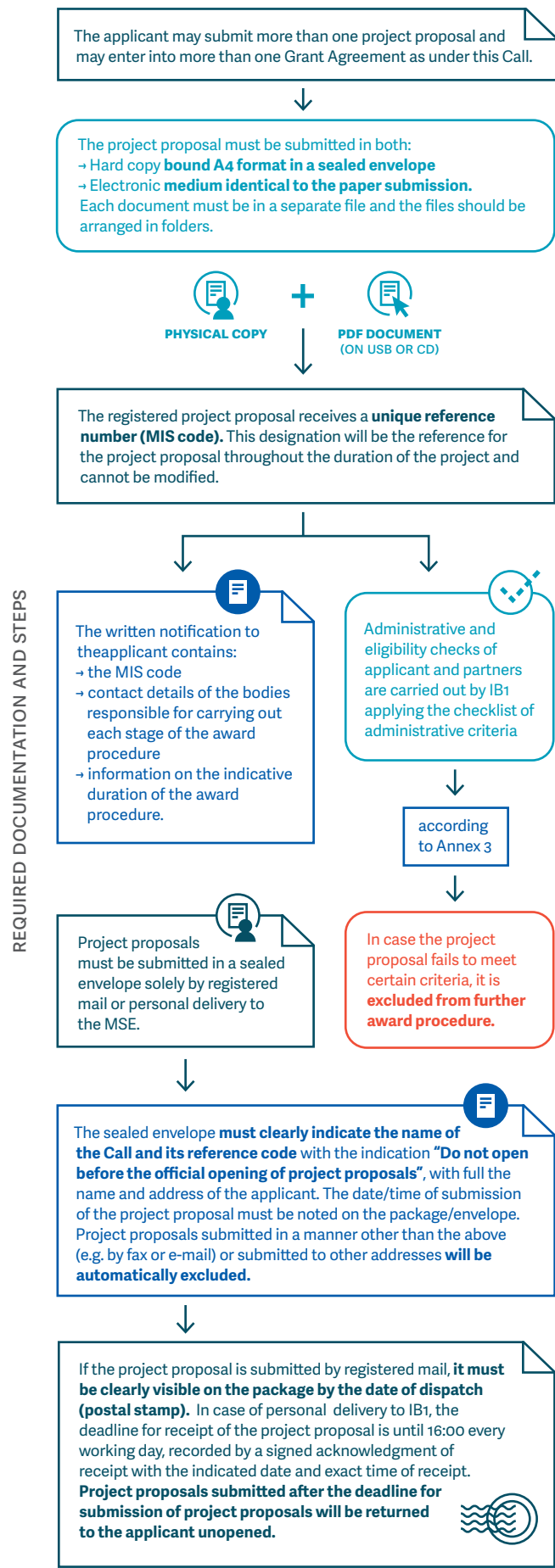
**SECTION 2.3 IMPLEMENTATION: Effective Resources and Management Quality**

SECTION 2.4 IMPLEMENTATION: Monitoring, Evaluation and Learning

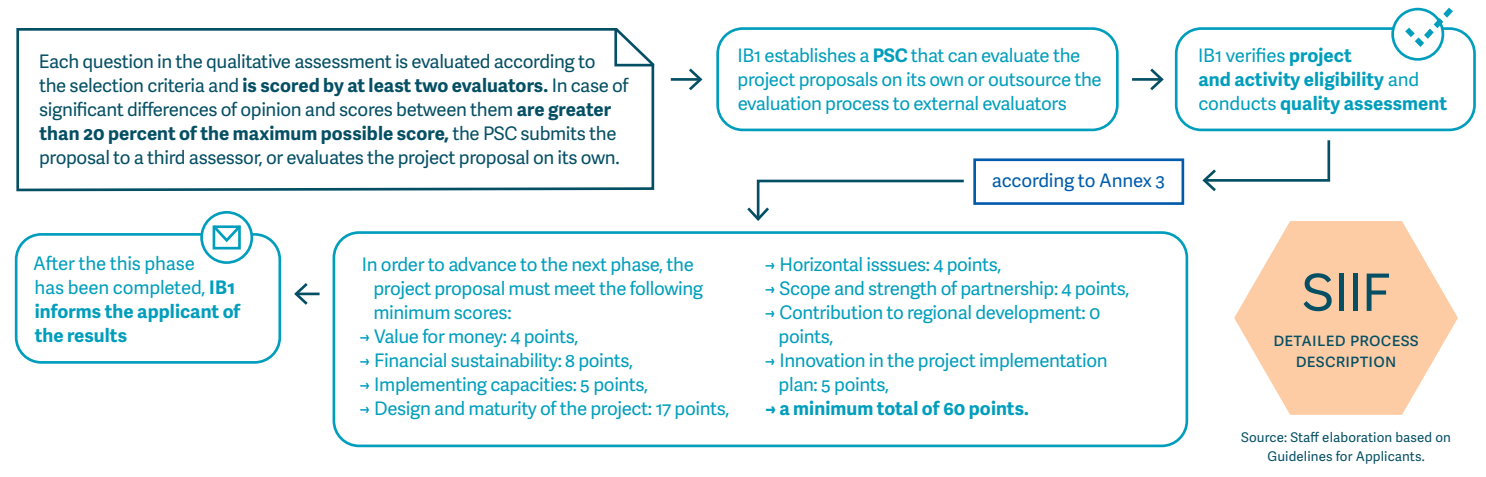
Source: Staff elaboration.

## APPENDIX V. Detailed process description

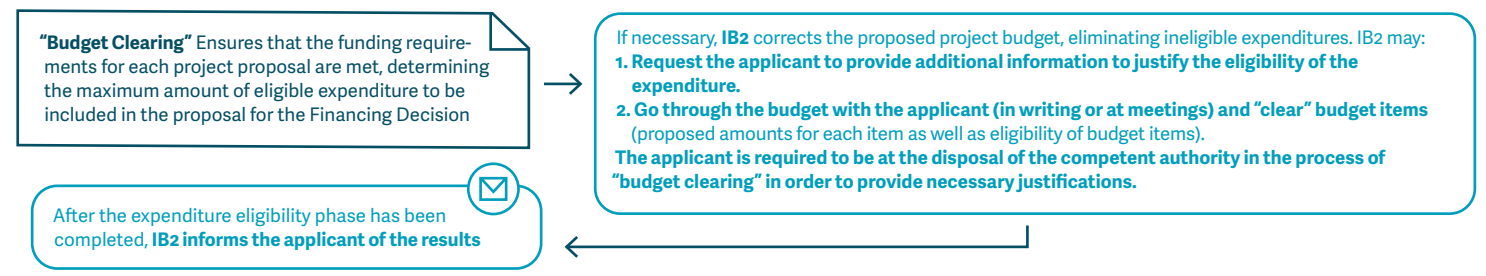
### PHASE 3 – Application, registration, administrative and eligibility checks of applicants and partners



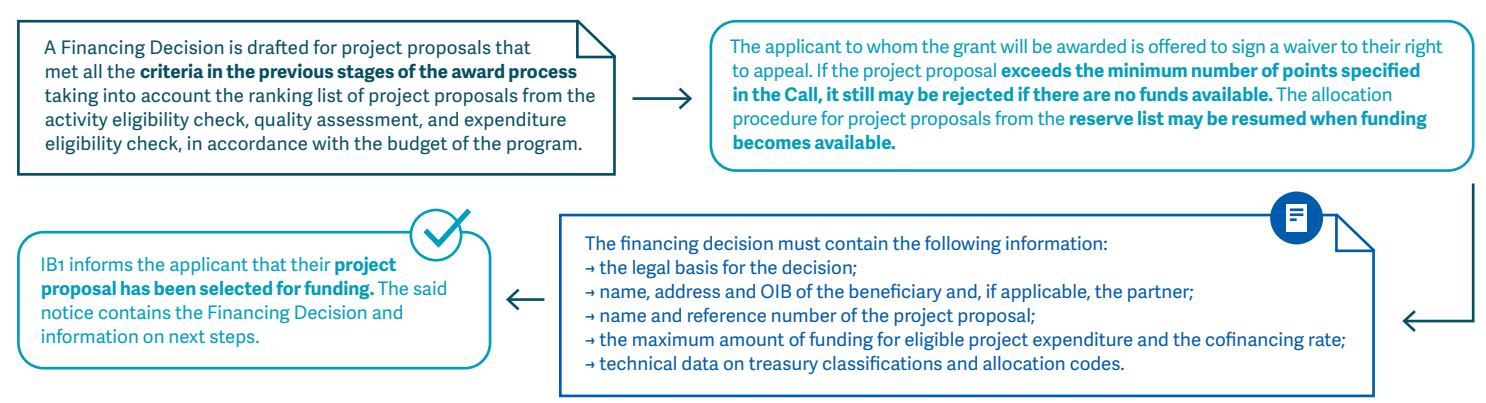
### PHASE 4, 4A & 4B – Applicant, project/activity eligibility check and project quality assessment



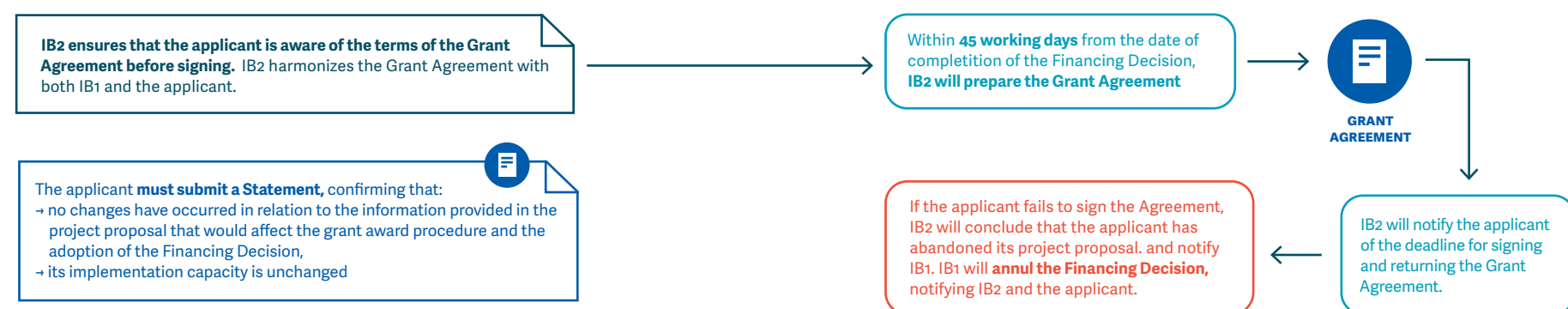
### PHASE 5 – Expenditure eligibility check



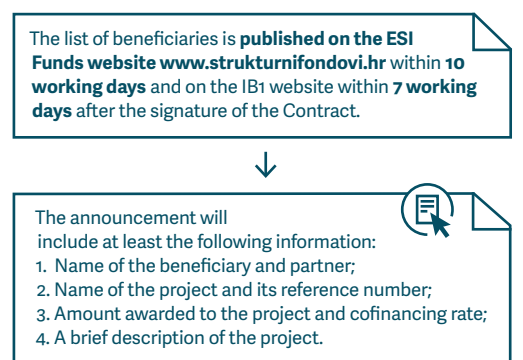
### PHASE 6 – Decision on financing



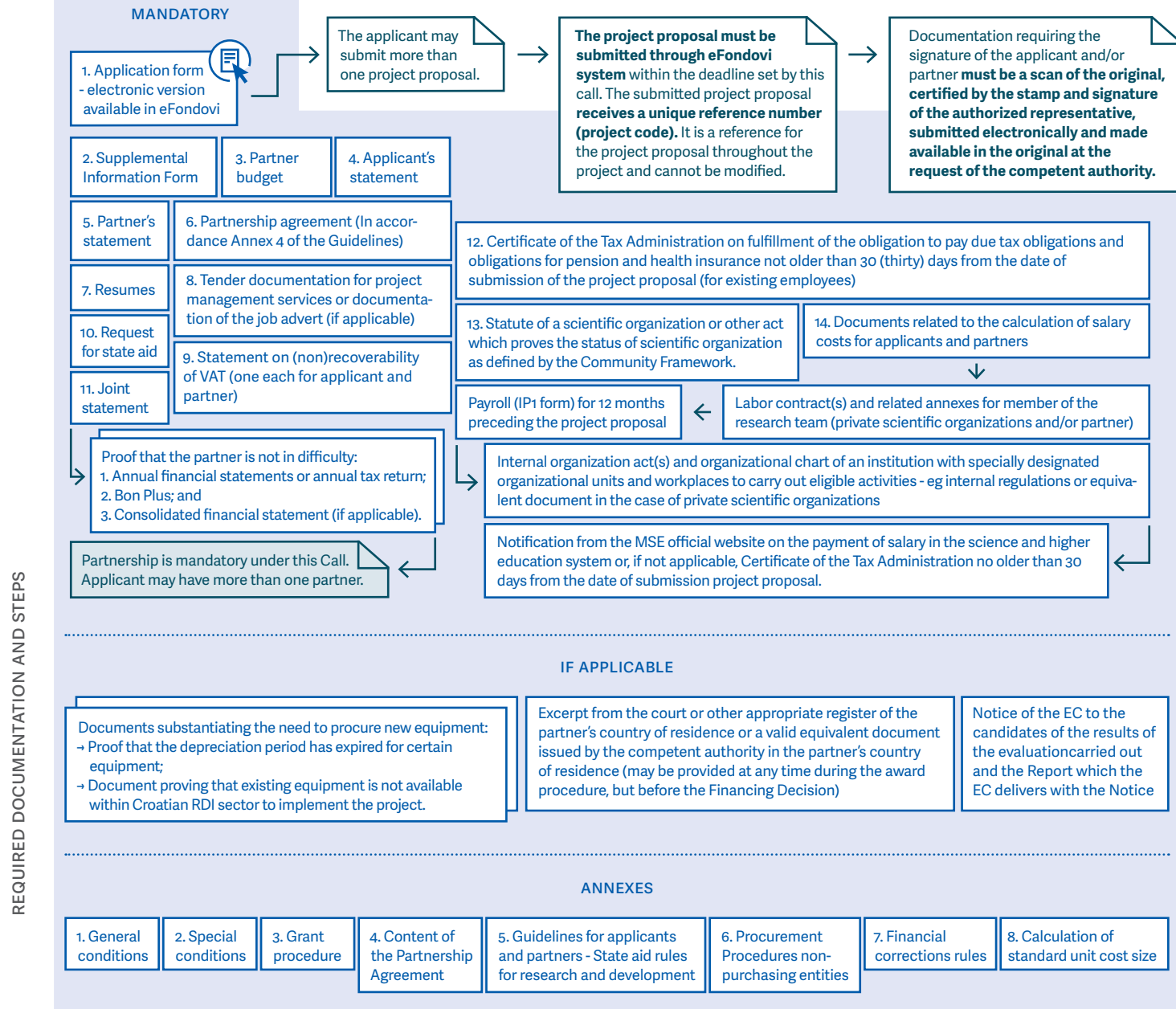
### PHASE 7 – Contracting



### PHASE 8 – Publication of the results of the Call



### PHASE 3 – Application and registration through the eFunds system

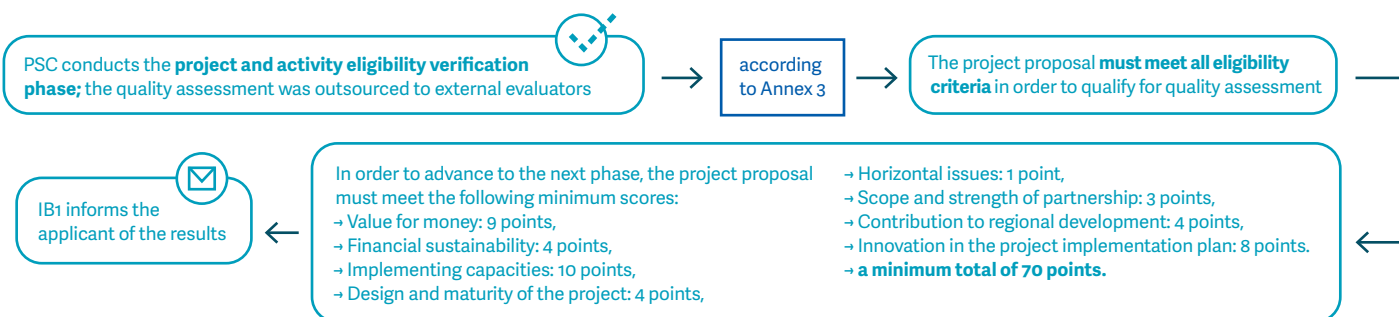


REQUIRED DOCUMENTATION AND STEPS

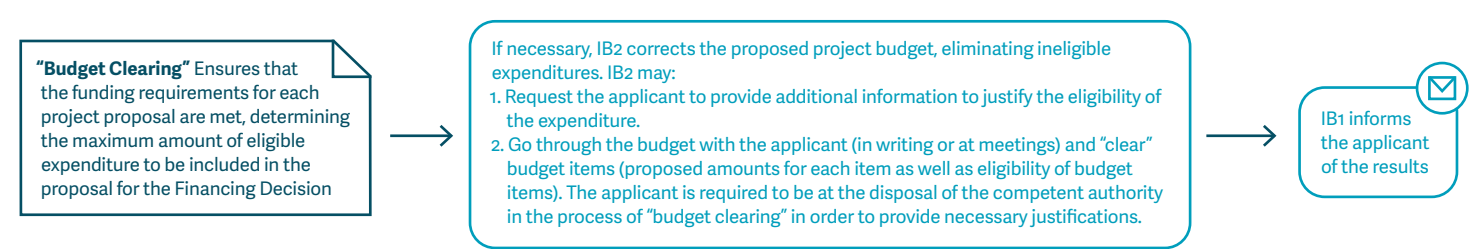
### PHASE 4, 4A & 4B – Administrative and eligibility checks of applicants and partners



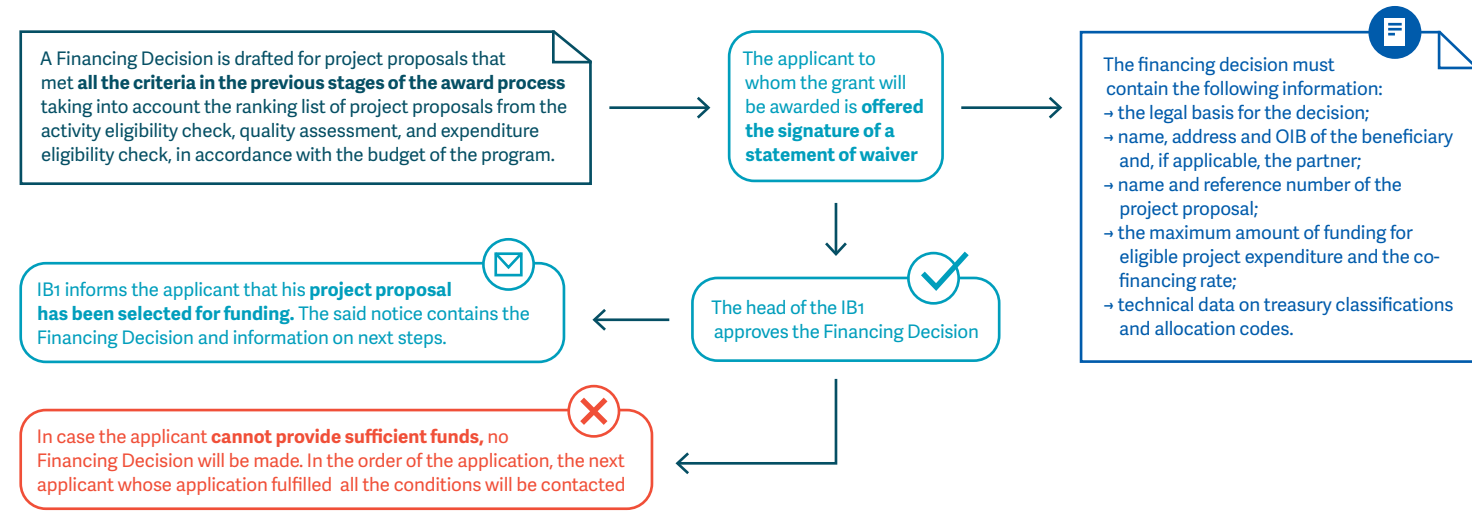
### PHASE 5 – Applicant, project/activity eligibility check and project quality assessment



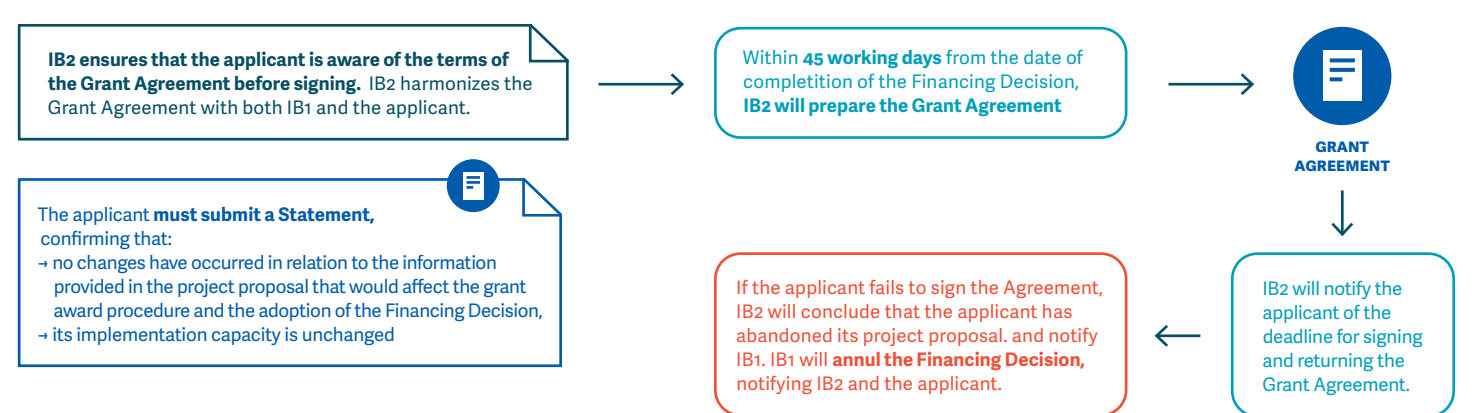
### PHASE 6 – Expenditure eligibility check



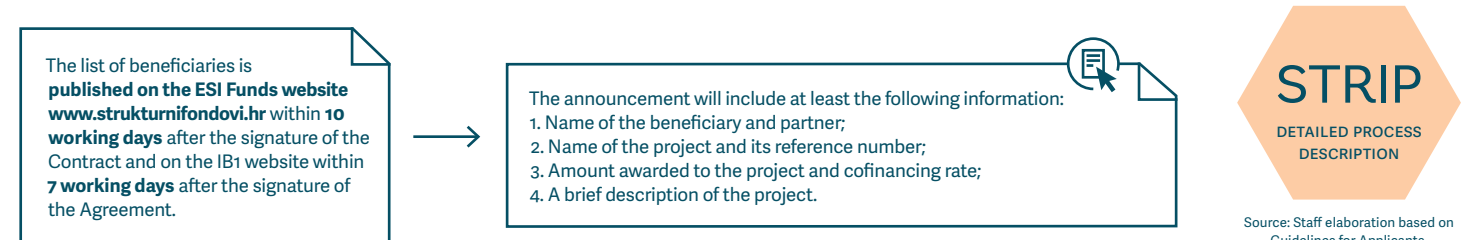
### PHASE 7 – Decision on financing



### PHASE 8 – Contracting



### PHASE 9 – Publication of the results of the Call



### PHASE 3 – Application and registration

The applicant may submit more than one project proposal under this Call. The number of individual grants that can be awarded to one beneficiary is not limited.

The project proposal must be submitted in one original in A4 format within one sealed package / envelope and must be bound in an integral part. The project proposal must also be submitted in one copy in an electronic medium identical to the paper version. Each document must be in a separate file and the files should be arranged in folders as described to the right and below:



The registered project proposal receives a unique reference number (MIS code). This designation will be the reference for the project proposal throughout the duration of the project and cannot be modified

The written notification to the applicant of the registration of his project proposal contains:  
 → the MIS code  
 → the contact details of the bodies responsible for carrying out each stage of the award procedure  
 → information on the indicative duration of the award procedure

Project proposals must be submitted in a sealed envelope / package solely by registered mail or personal delivery.

→ the name and address of the applicant are indicated on the received package / envelope;  
 → the name and reference number of the Call are indicated on the received package / envelope;  
 → the date and exact time of submission of the project proposal (in accordance with point 7.2 of the Instruction - Submission of project proposals) is indicated on the received project proposal

MANDATORY	
Application form A	Joint statement of partners (not applicable for beneficiaries who are budget users)
Application form B	Business plan (for projects with a total value up to HRK 75,000,000.00; all tables pertaining to the Business plan must be arranged in the folder "Form 9. Business plan")
Application form B – budget table	
List of minimum content of the Partnership Agreement	Feasibility study (for projects worth over HRK 75,000,000.00)
Statement of aid used	Feasibility Study – Cost-Benefit Analysis
Applicant's statement	Partner's statement
	Joint declaration of the applicant

IF APPLICABLE	
Evidence related to the impact assessment of the intervention on the environment / ecological network, as indicated in Form 9. Business plan, item 8. Infrastructure component of the project and Form 10. Feasibility study, item 9. Infrastructure component of the project	
Certificate of tax administration in the original that the applicant has fulfilled his obligations to pay tax obligations and obligations for pension and health insurance not older than 30 days or a valid equivalent document in the manner prescribed by the Guidelines for Applicants	
Bon Plus for the last approved accounting period or a valid equivalent document as prescribed in the Instruction for Applicants. Research and dissemination organizations as a replacement for Bon Plus should submit the decision of the responsible person	
Consolidated Financial Statements for Affiliates and, in the case of recapitalization in the current year, the interim balance sheet in the manner prescribed by the Guidelines for Applicants	Construction-related evidence as indicated in Form 9. Business Plan, Item 8. Project Infrastructure Component and Form 10. Feasibility Study, Item 9. Project Infrastructure Component
Notification on classification of a business entity by NKD 2007. From the Central Bureau of Statistics in the manner prescribed by the Guidelines for Applicants or a valid equivalent document	
Payroll for a period of 12 months in the manner prescribed by the Guidelines for Applicants	

#### ANNEXES

1. General conditions	2. Special conditions	3. Grant procedure	4. Procurement procedures for persons who are not subject to public procurement law	5. Procurement plan	6. Request for advance payment
7. Final Report and Checklist	8. Report after proven project	9. Request for reimbursement	10. Minimum contents of the advance payment guarantee	11. Summary of IRI Call	12. Financial corrections rules

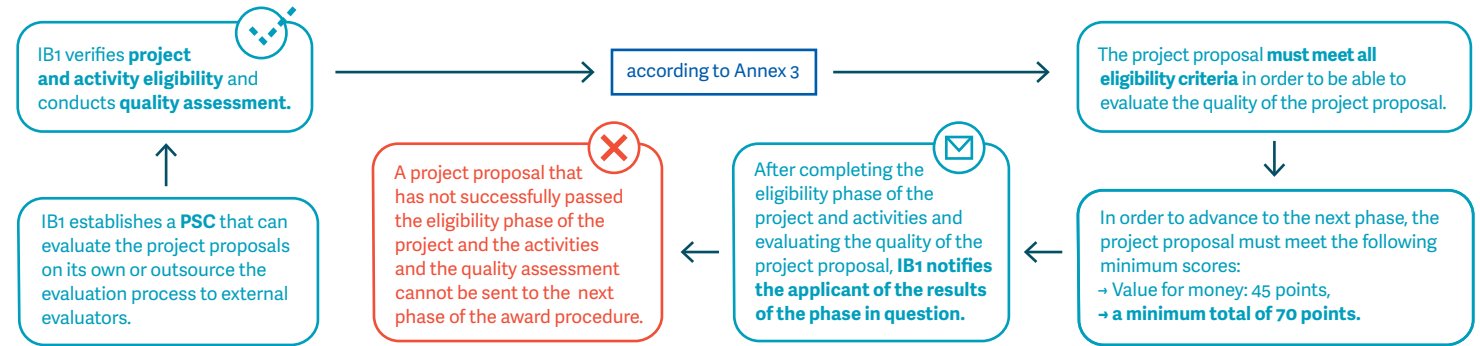
### PHASE 4 – Administrative and eligibility checks of applicants and partners

The administrative and eligibility checks of applicant and partner are carried out by IB1 applying the table of administrative criteria

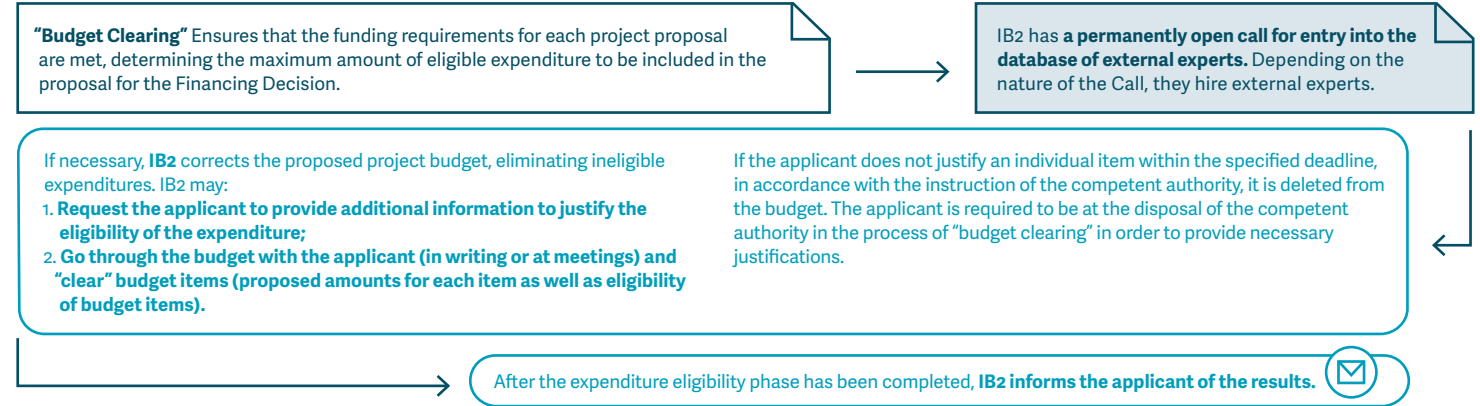
according to Annex 3

In case the project proposal fails to meet certain criteria, it is excluded from further award procedure

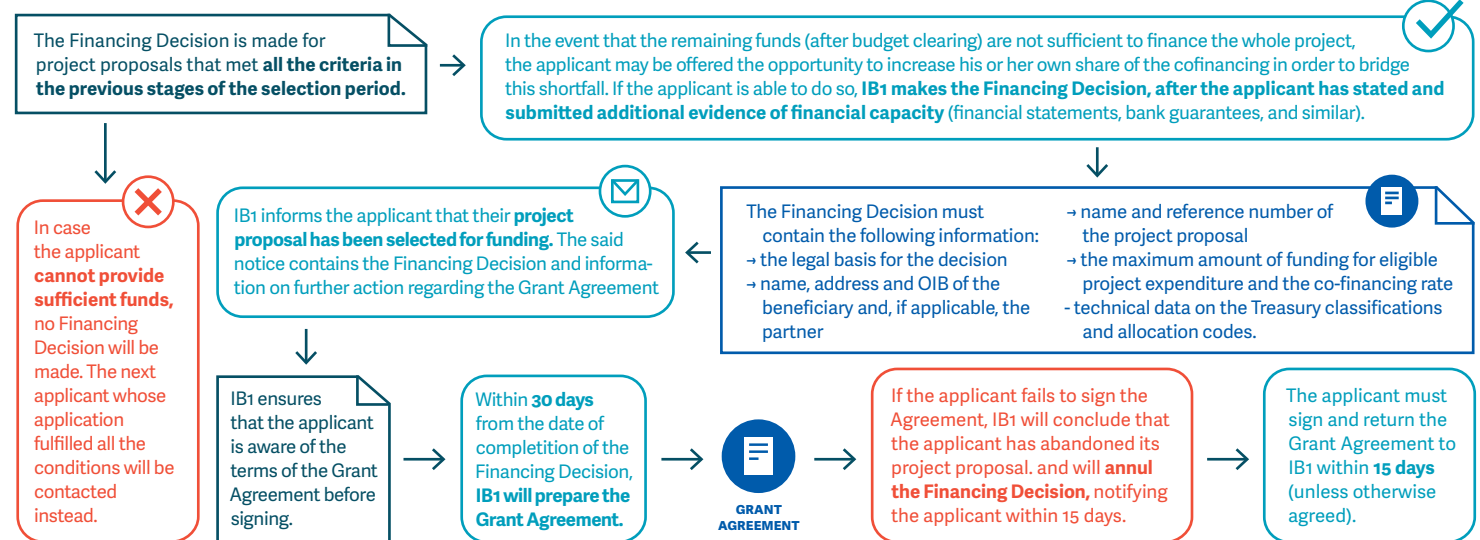
### PHASE 5 – Applicant, project/activity eligibility check and project quality assessment



### PHASE 6 – Expenditure eligibility check



### PHASE 7 – Decision on financing



### PHASE 8 – Contracting

The applicant must provide a valid bank guarantee to IB1 as collateral for advance payment. The applicant must submit a signed statement, confirming that:  
 → no changes have occurred in relation to the information provided in the project proposal that would affect the grant award procedure and the adoption of the Financing Decision  
 → its implementation capacity is unchanged

### PHASE 9 – Publication of the results of the Call

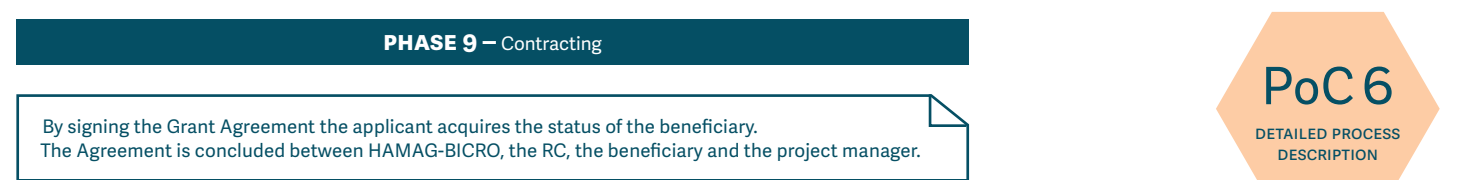
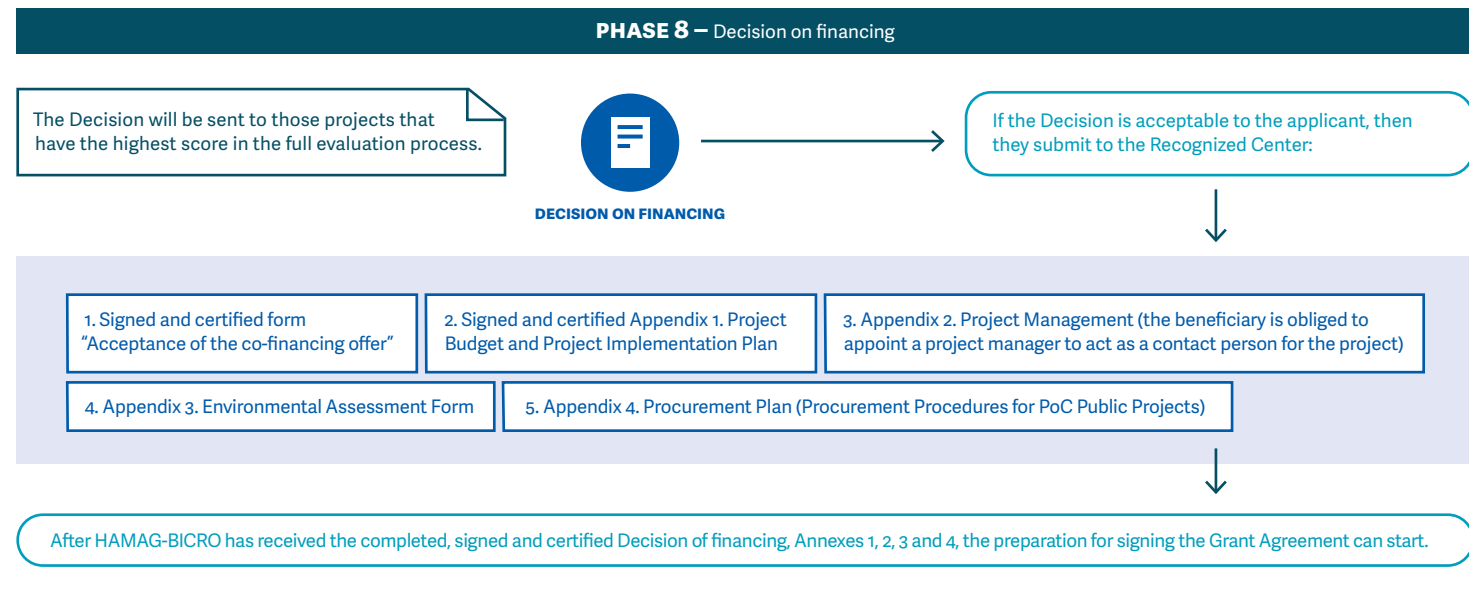
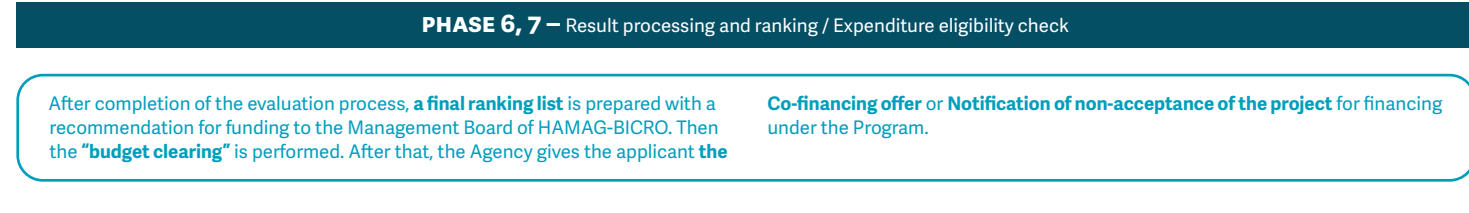
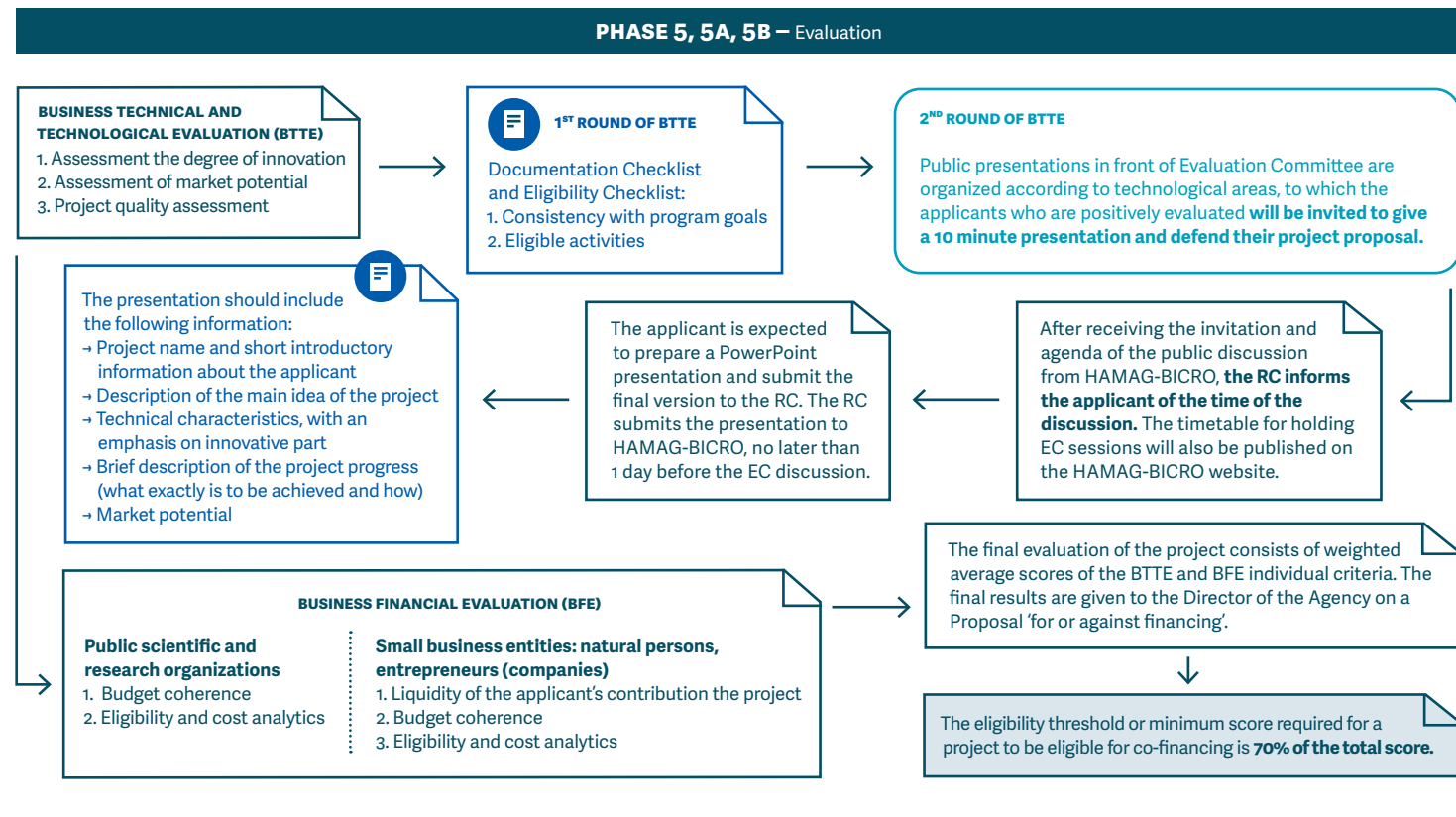
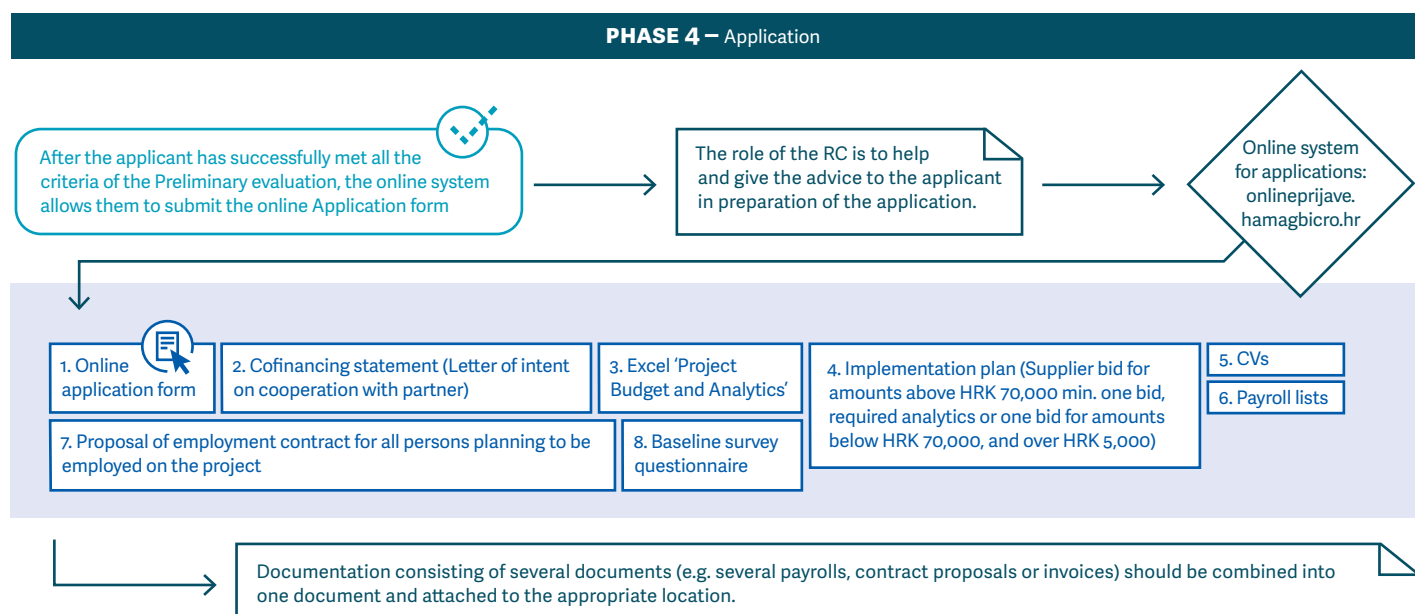
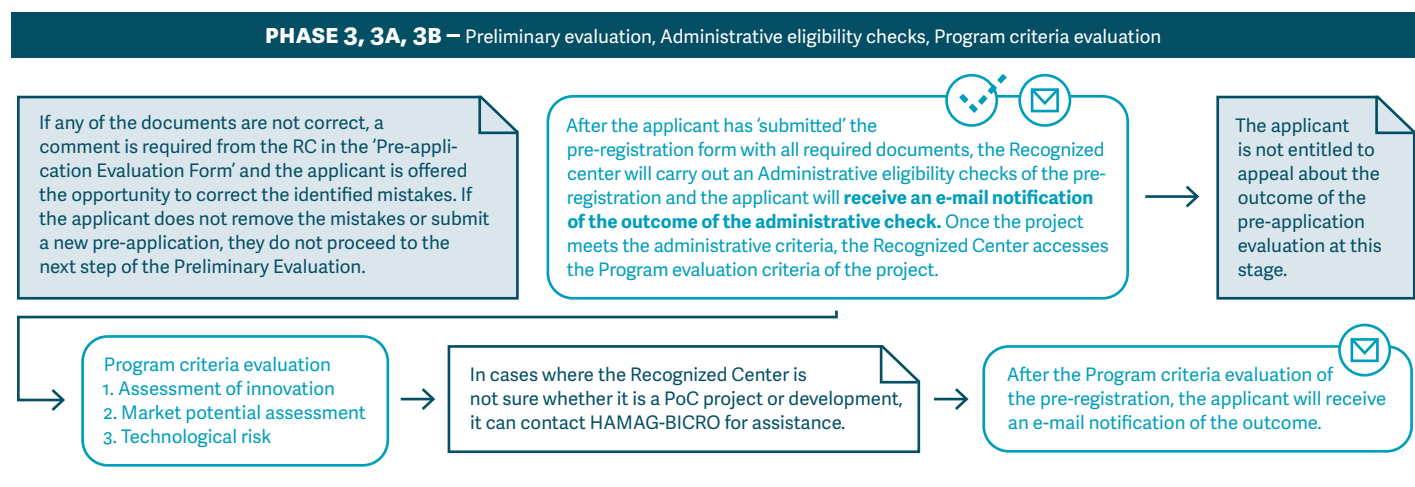
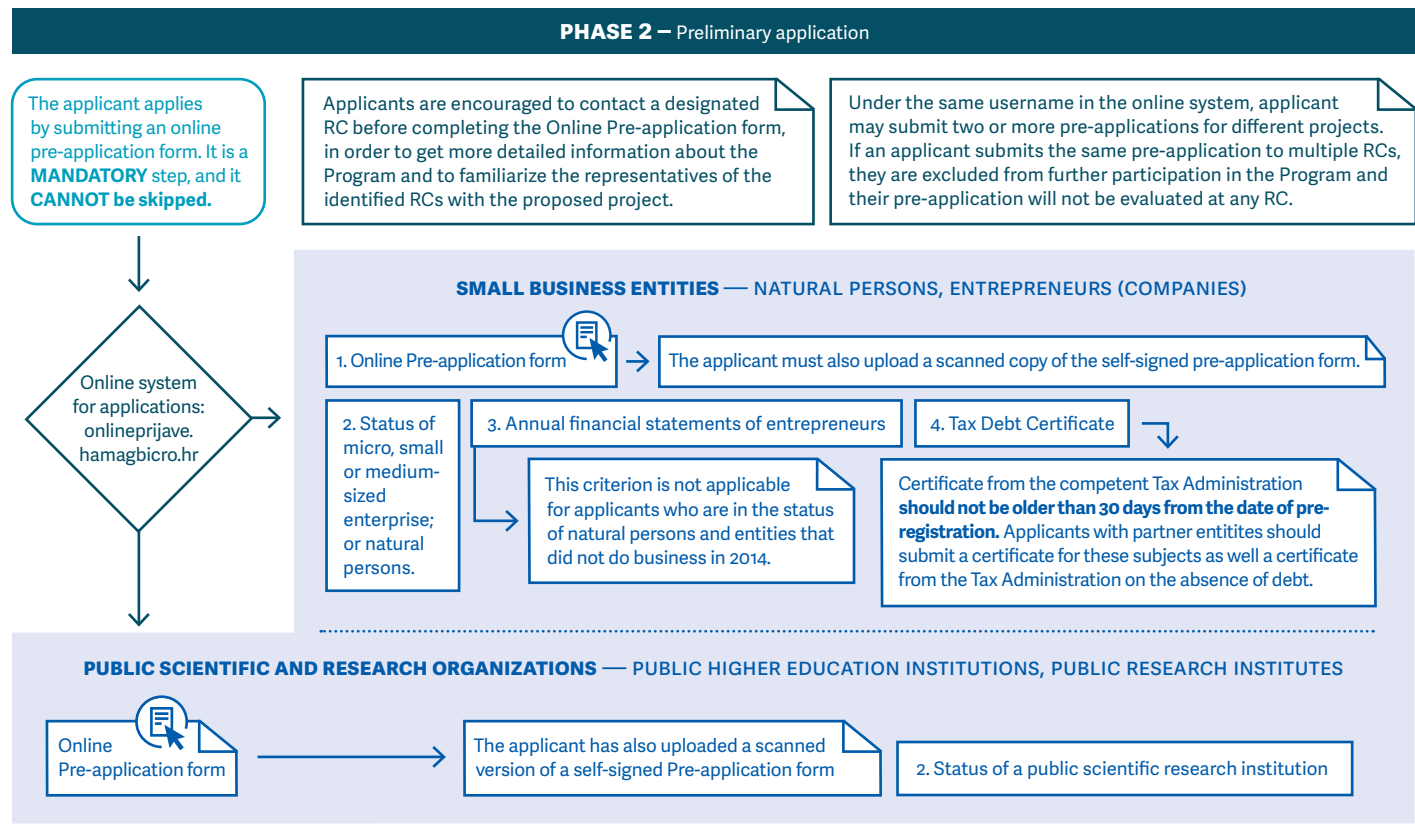
The list of beneficiaries is published on the ESI Funds website [www.strukturifondovi.hr](http://www.strukturifondovi.hr) and on the IB1 website within 10 days after the signature of the Contract.

The announcement will include at least the following information:  
 1. Name of the beneficiary and partner;  
 2. Name of the project and its reference number;  
 3. Amount awarded to the project and cofinancing rate;  
 4. A brief description of the project.

IRI

DETAILED PROCESS DESCRIPTION

Source: Staff elaboration based on Guidelines for Applicants.






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